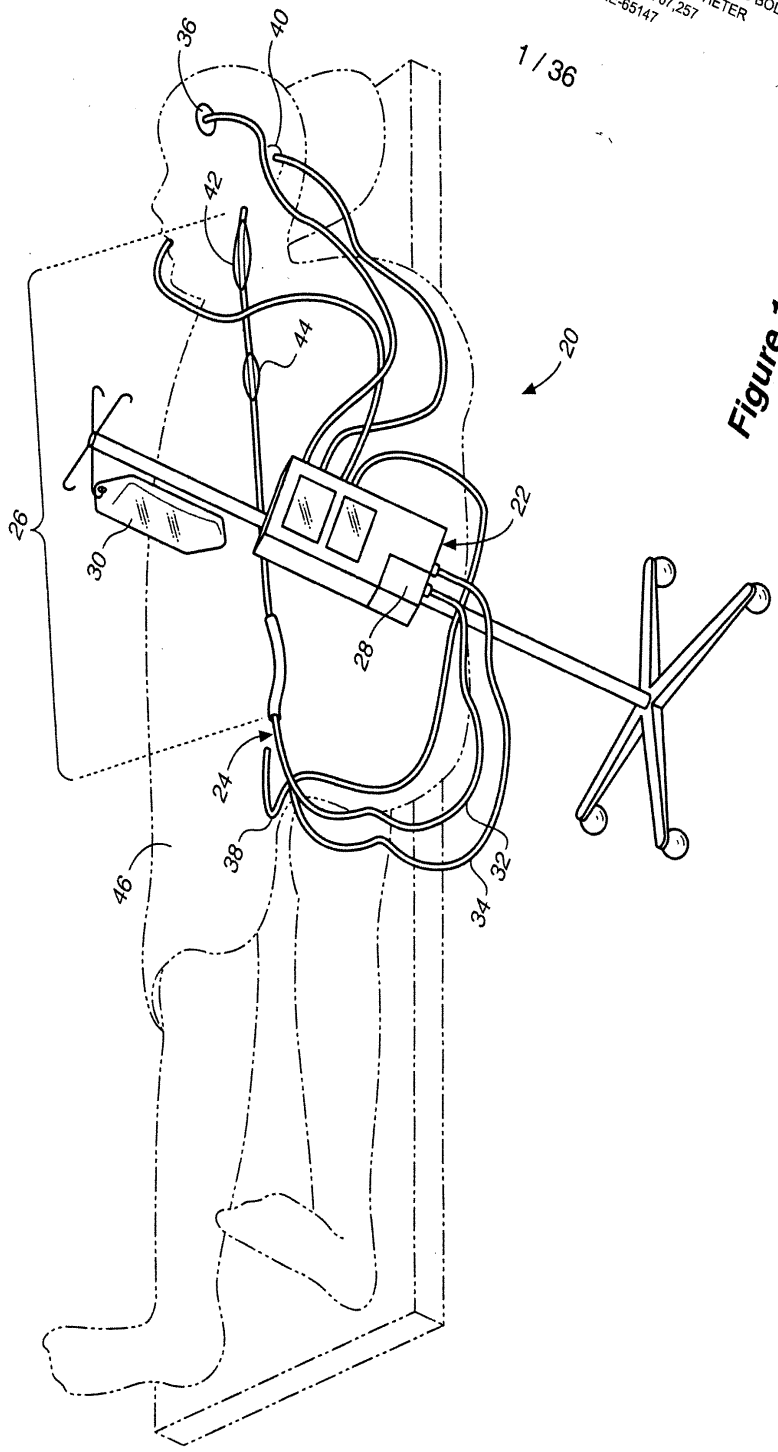

Figure 1

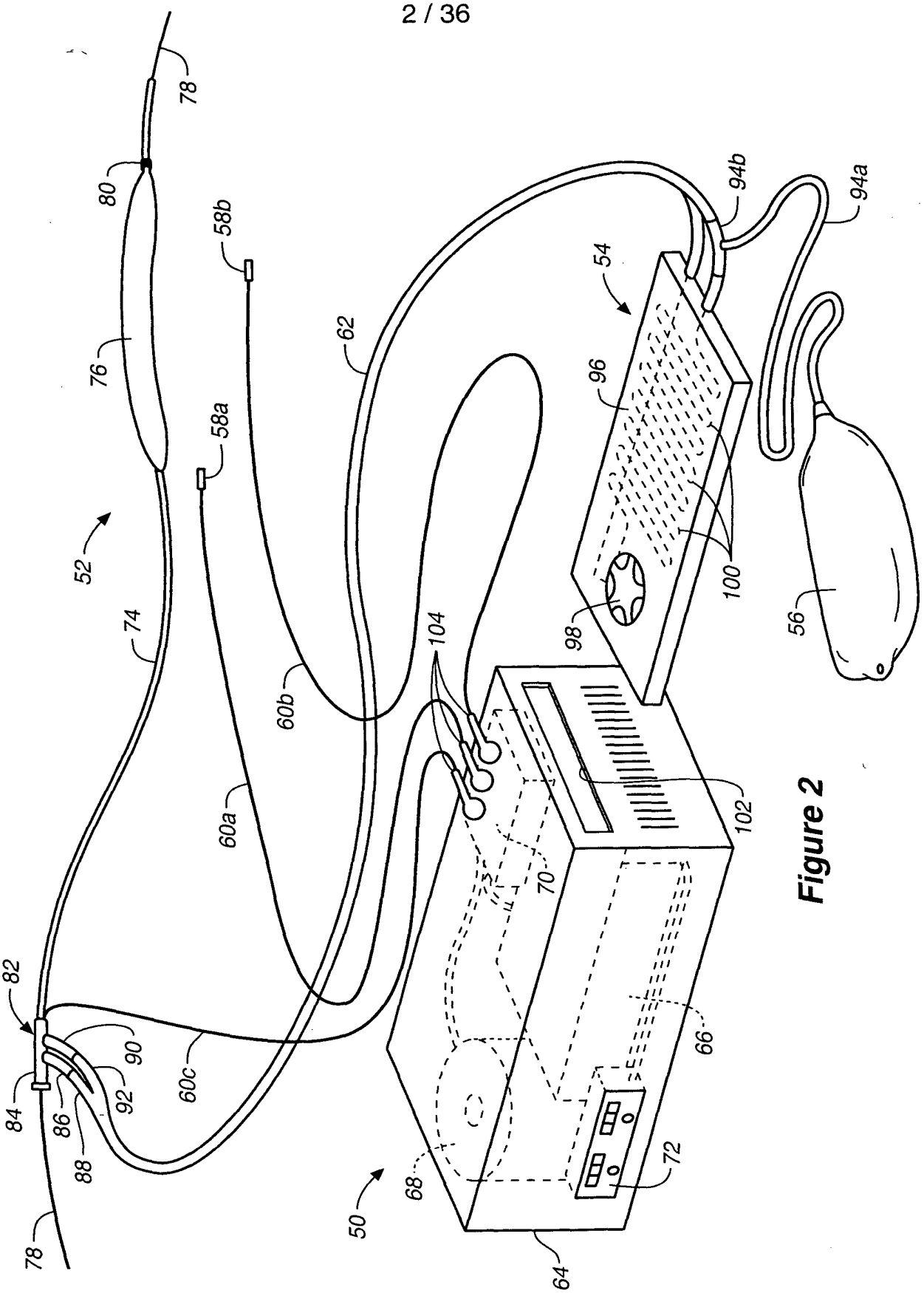
78
80
58b
94b
94a
54
62
76
96
58a
52
74
104
60b
98
100
56
60a
102
70
82
66
90
60c
84
86
92
88
68
72
50
78
64

Figure 2

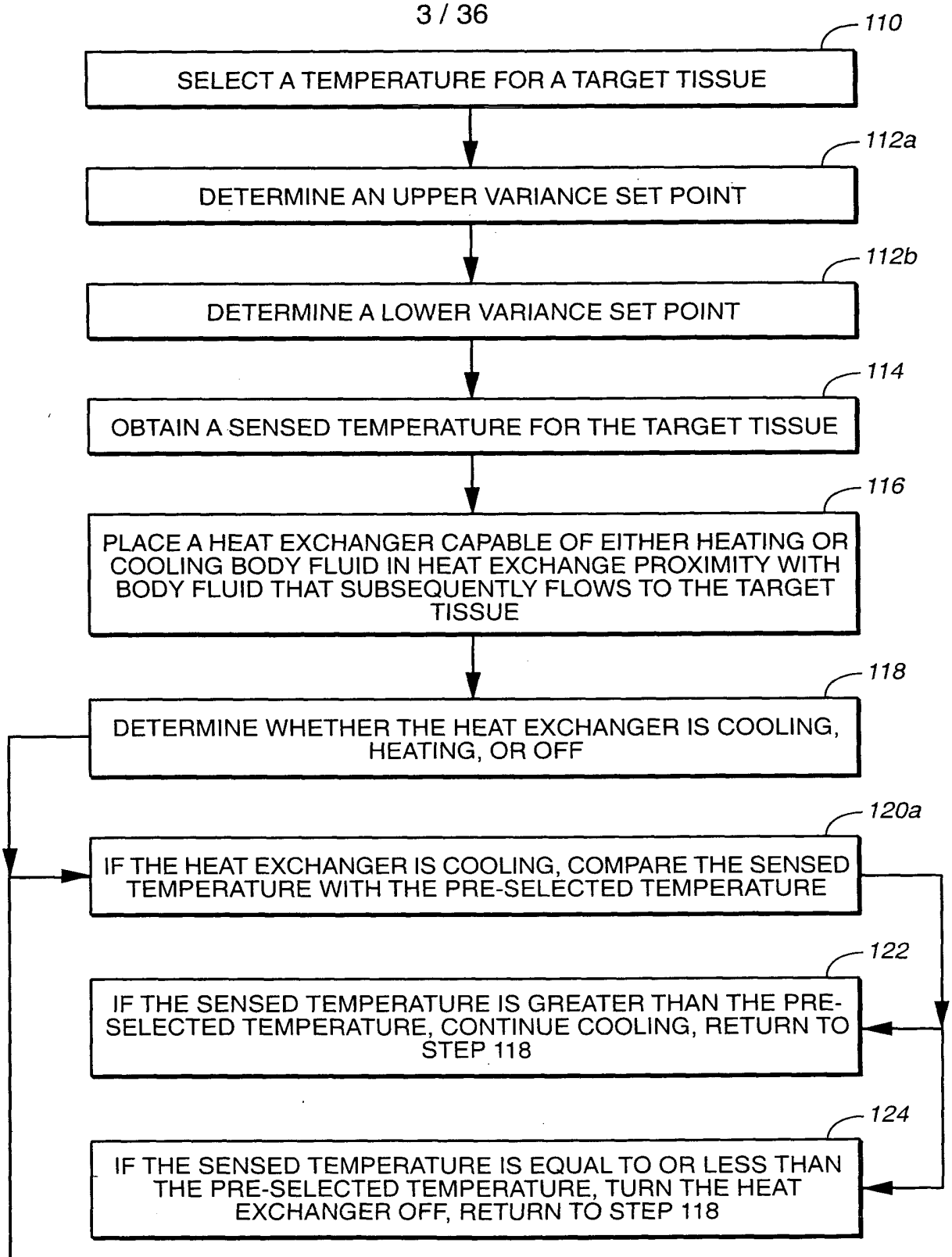

Figure 3A

To Figure 3B

From Figure 3A

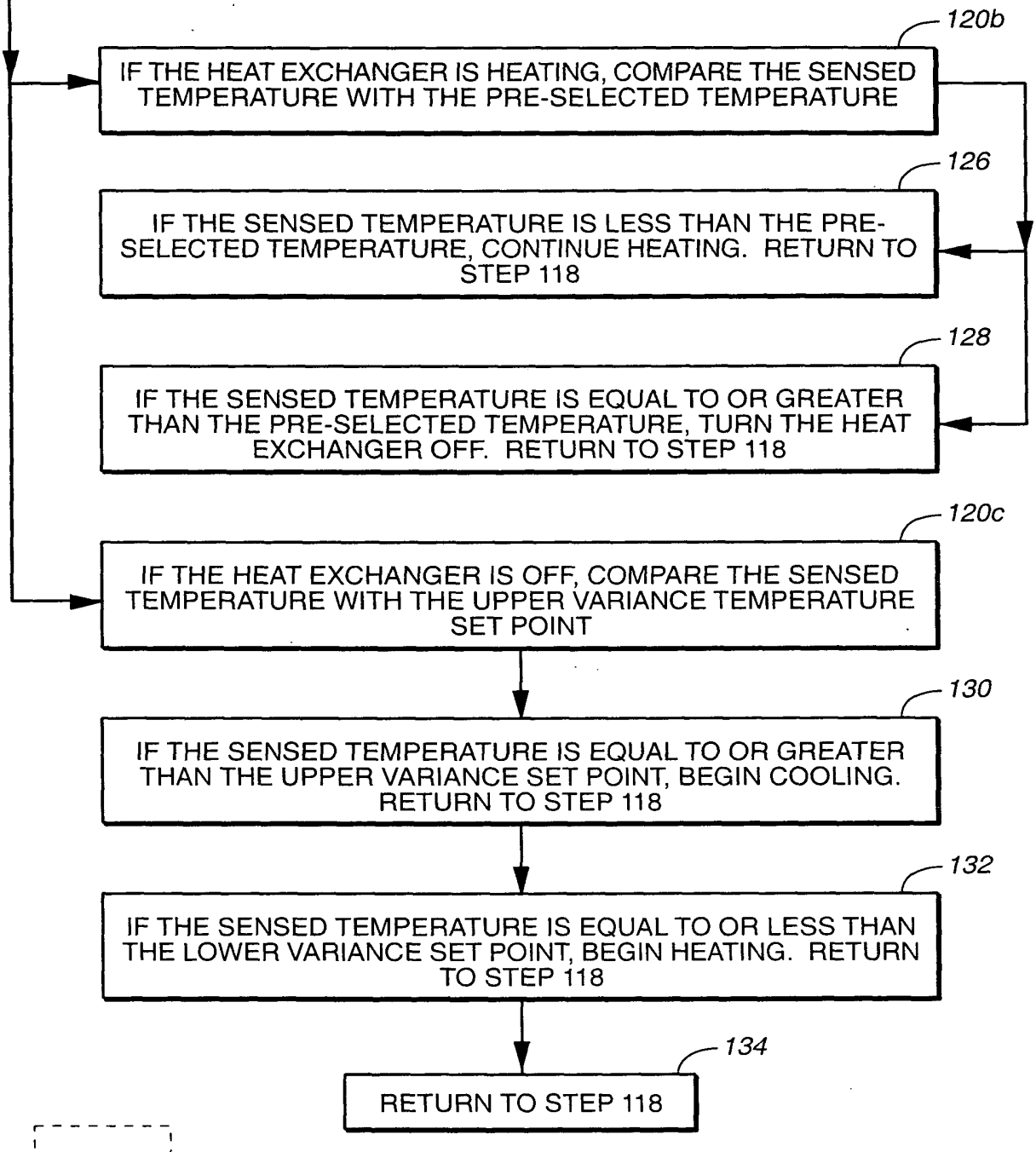

Figure 3B

FIG._3A

FIG._3B

FIG._3

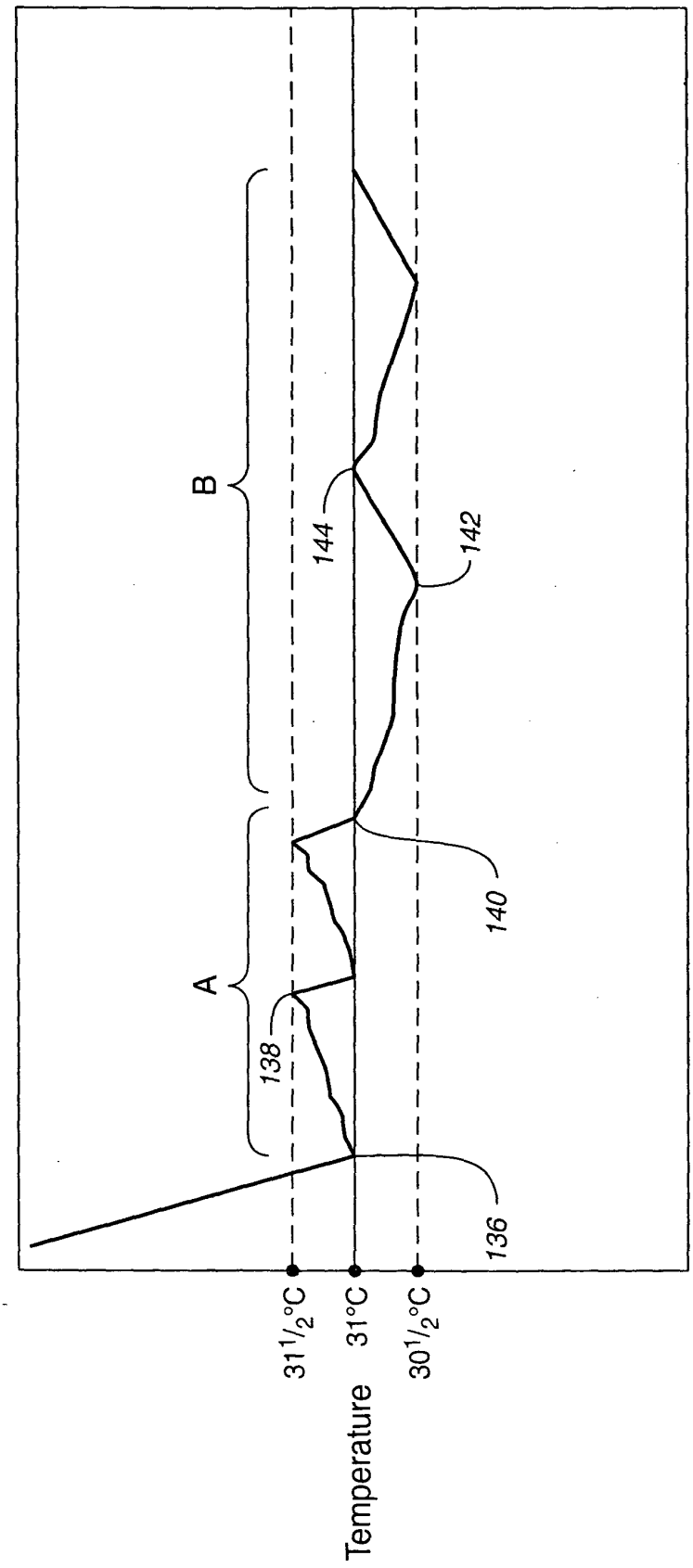
Temperature
Time
31°C = Pre-selected temperature
31 1/2°C = Upper variance set point
30 1/2°C = Lower variance set point
A
B
136
138
140
142
144

Figure 4

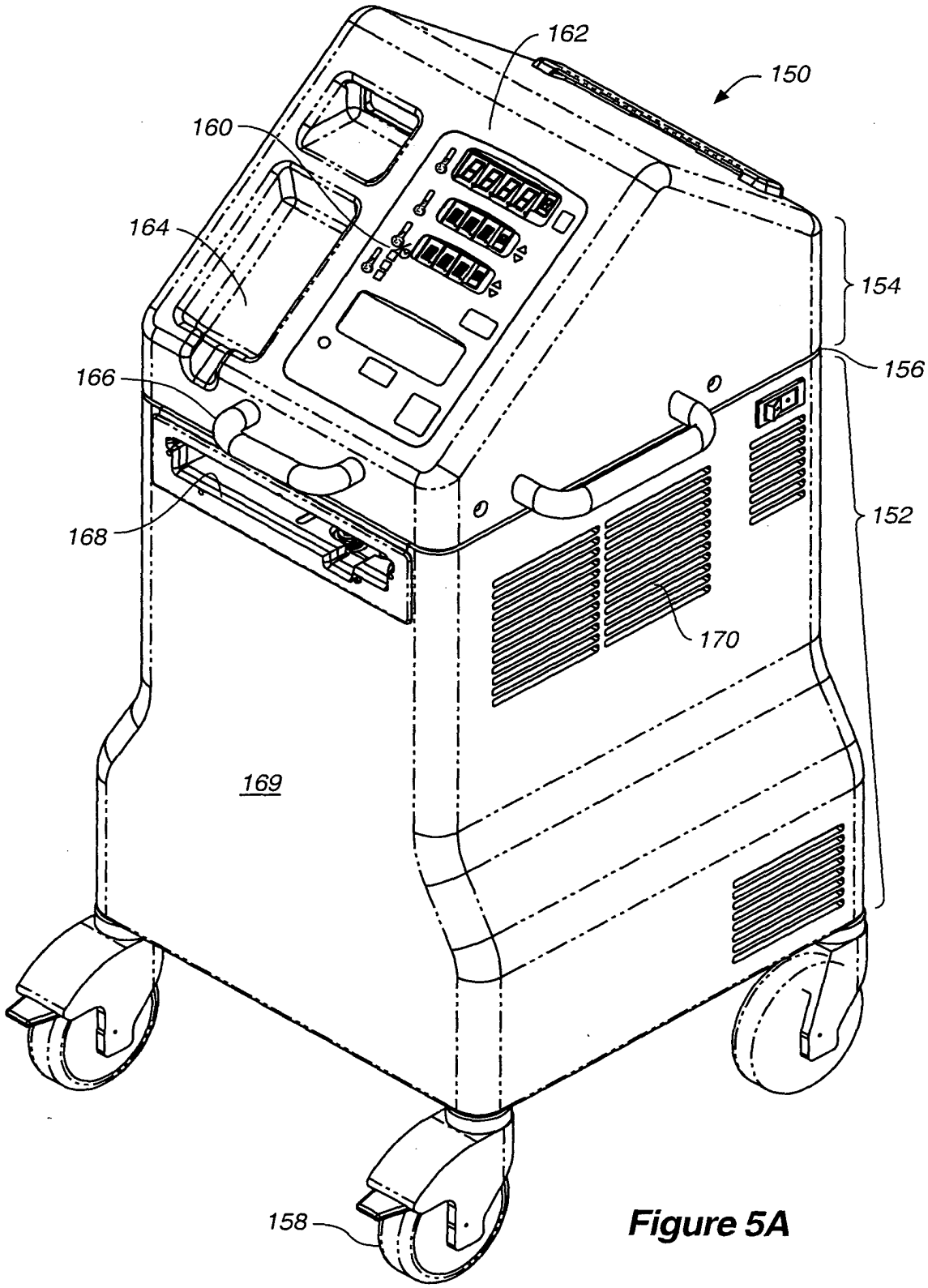

Figure 5A

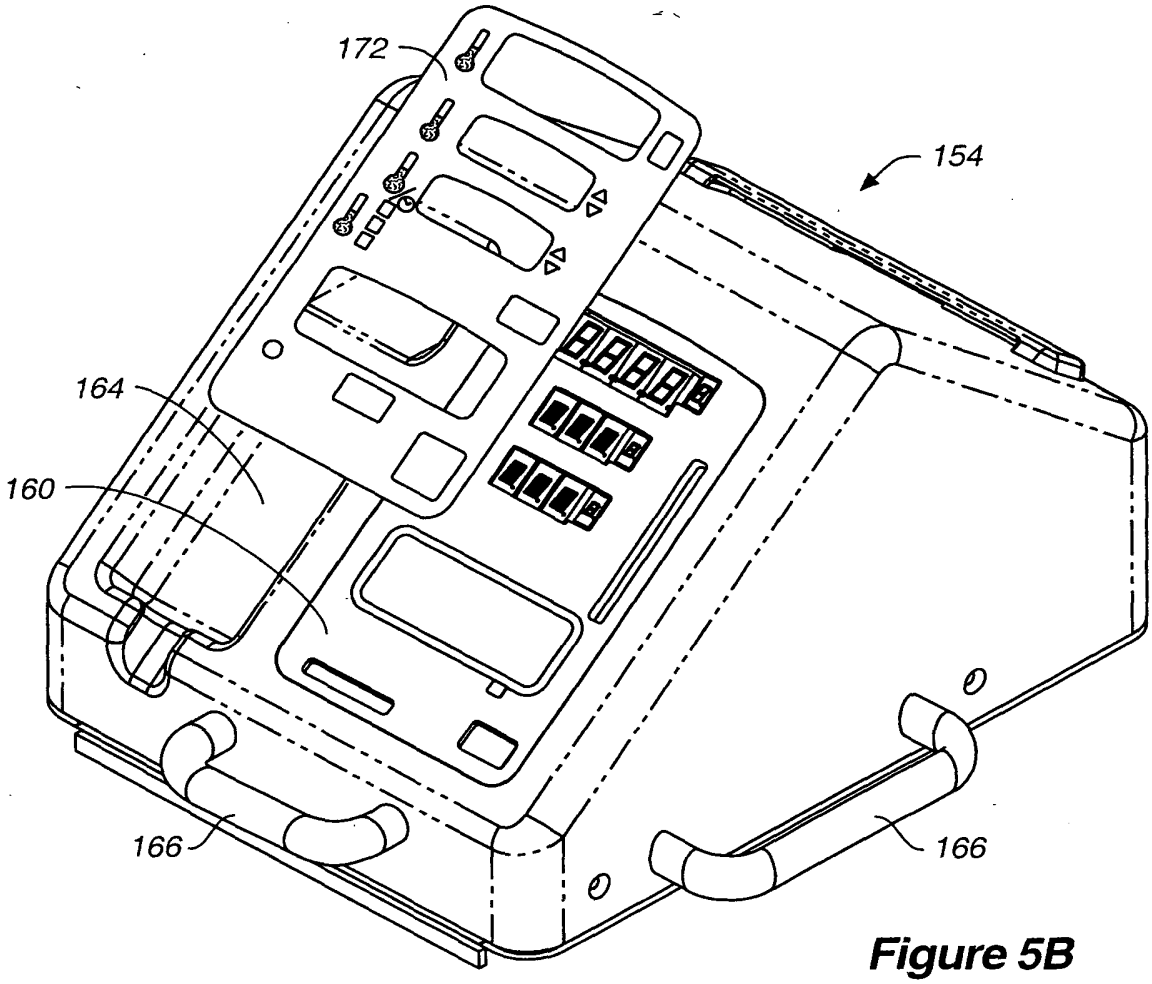

Figure 5B

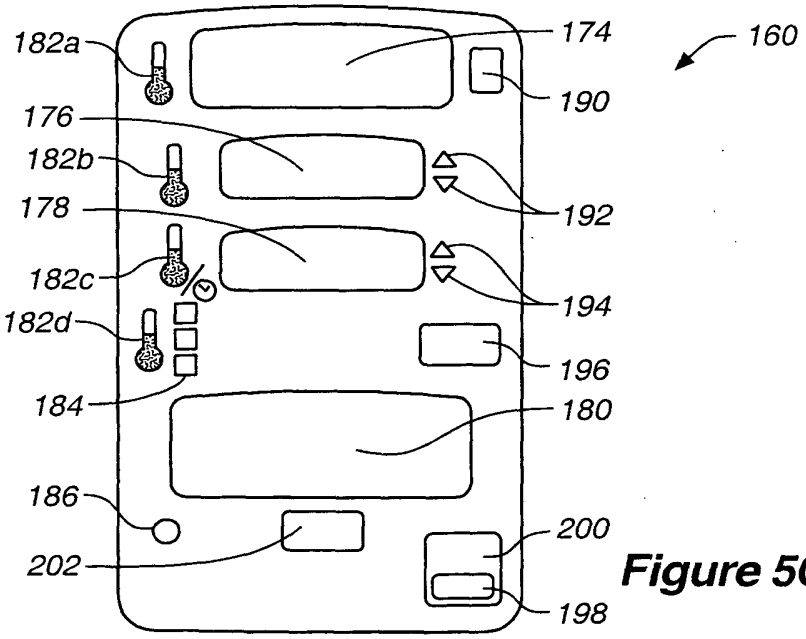

Figure 5C

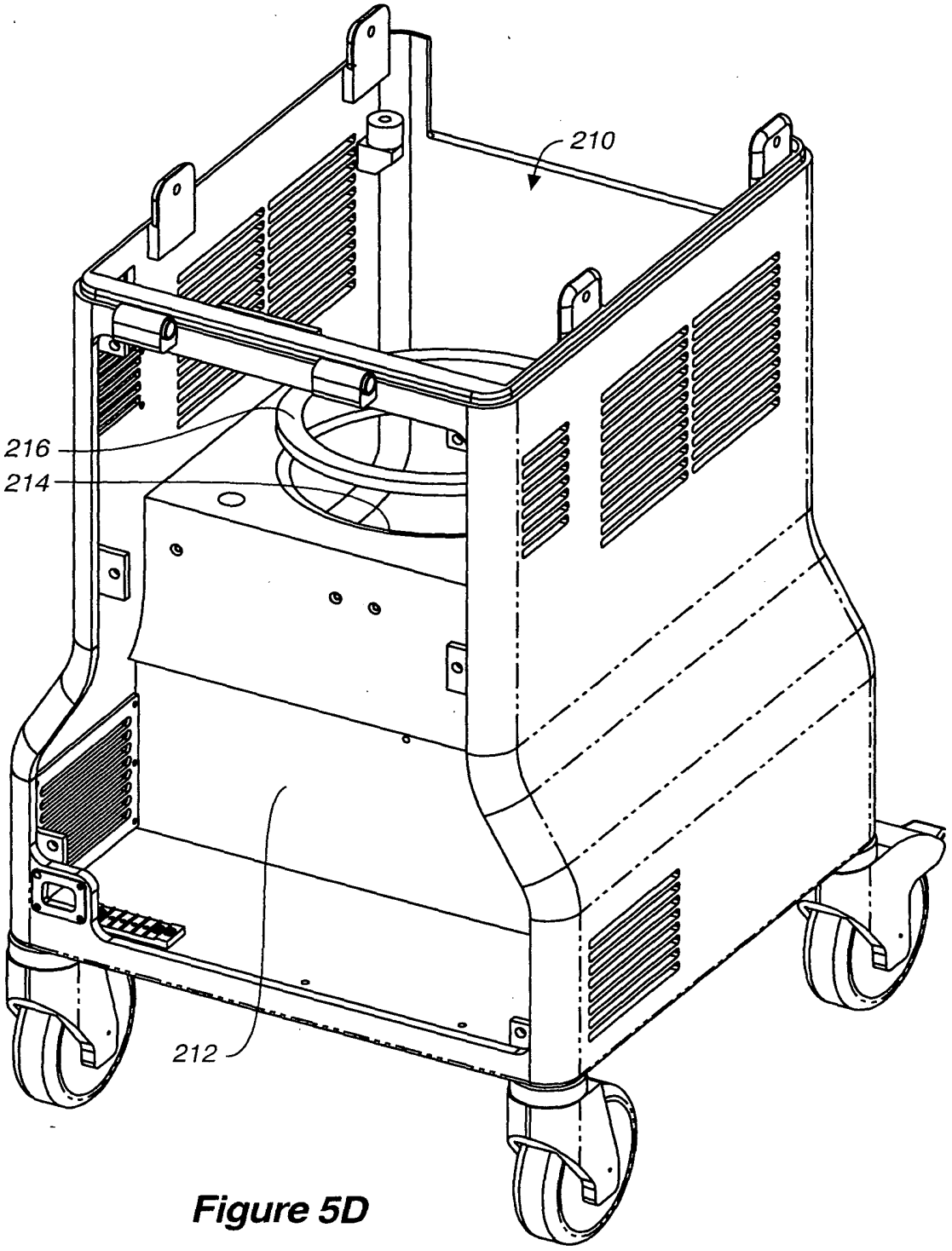

Figure 5D

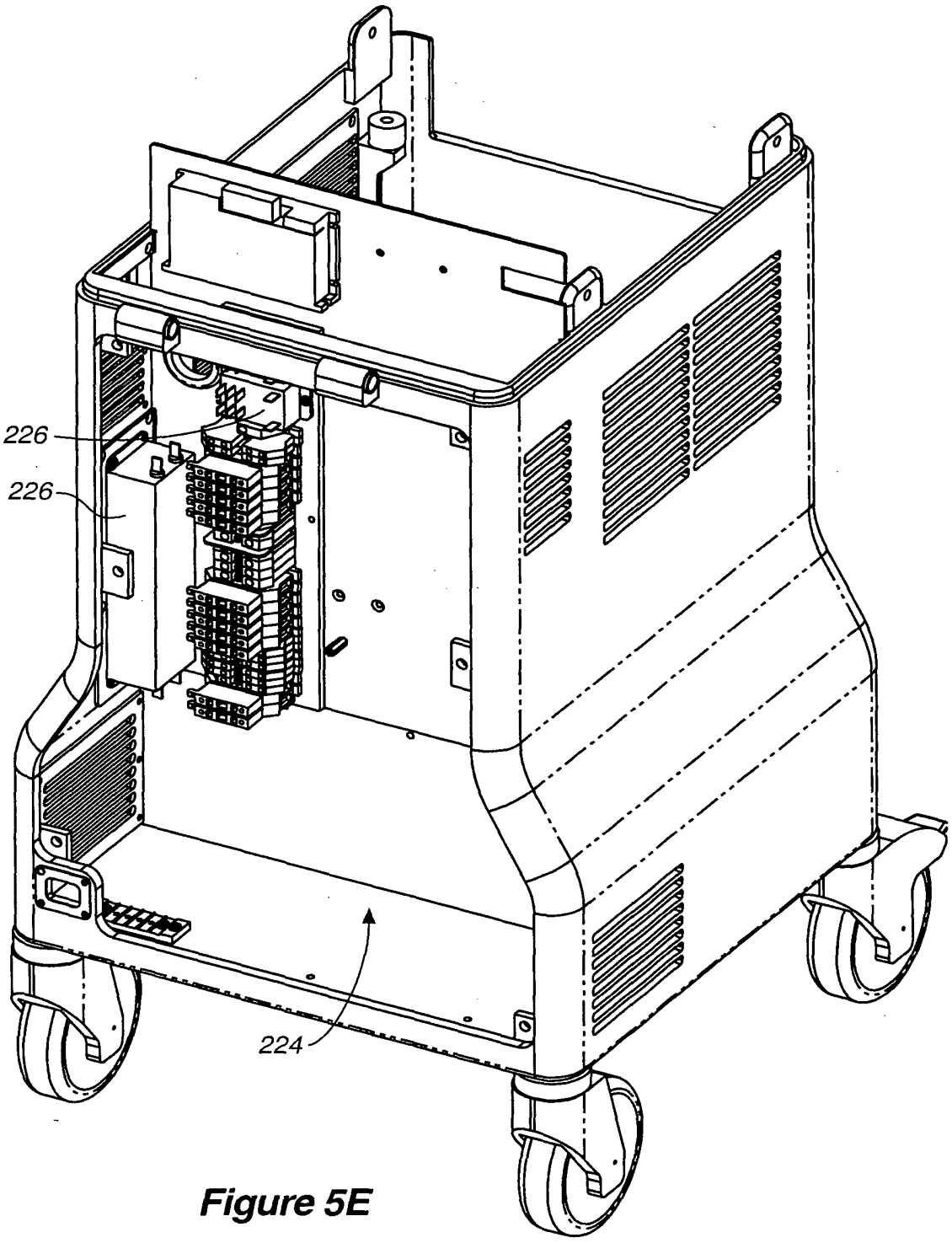

Figure 5E

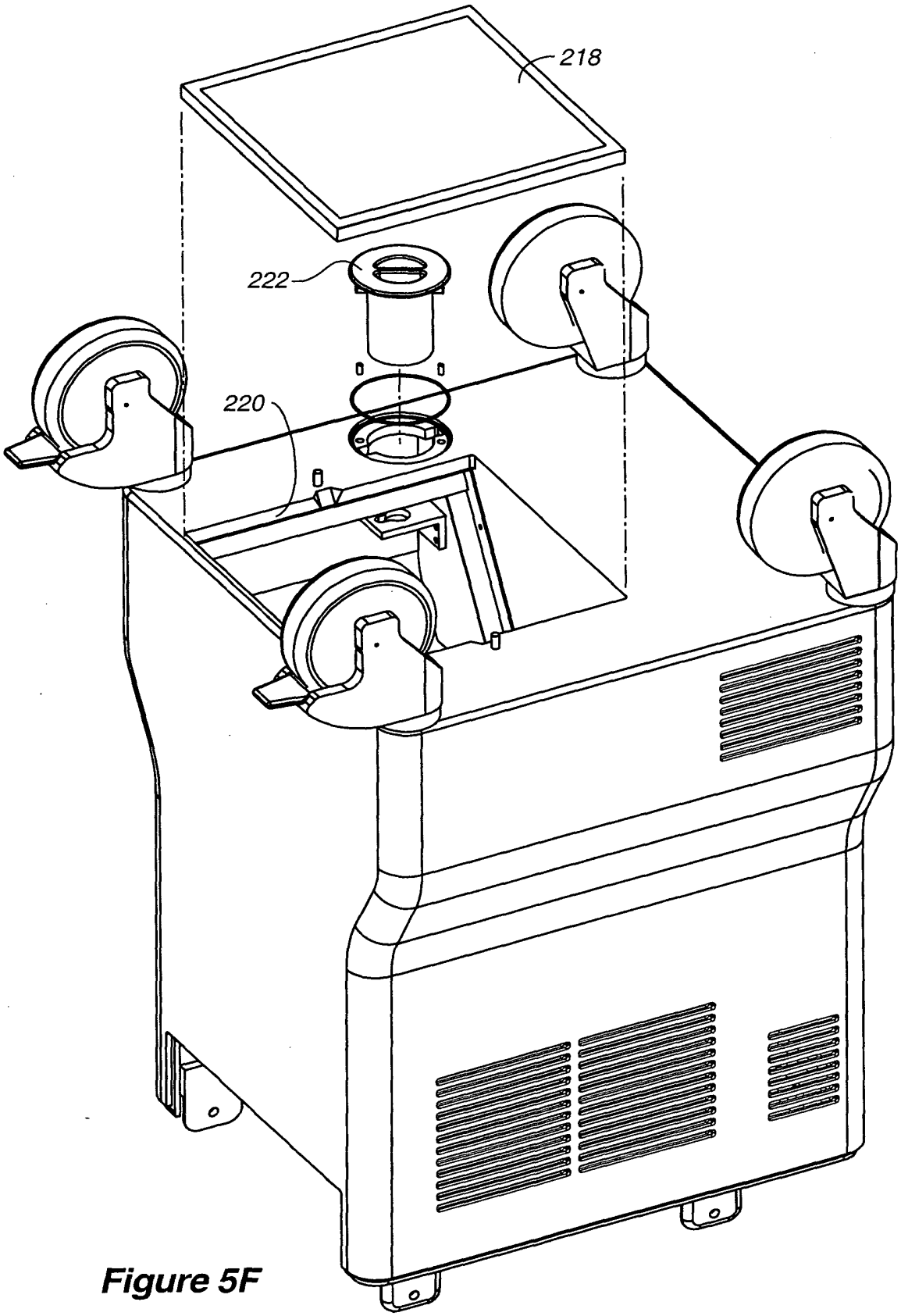

Figure 5F

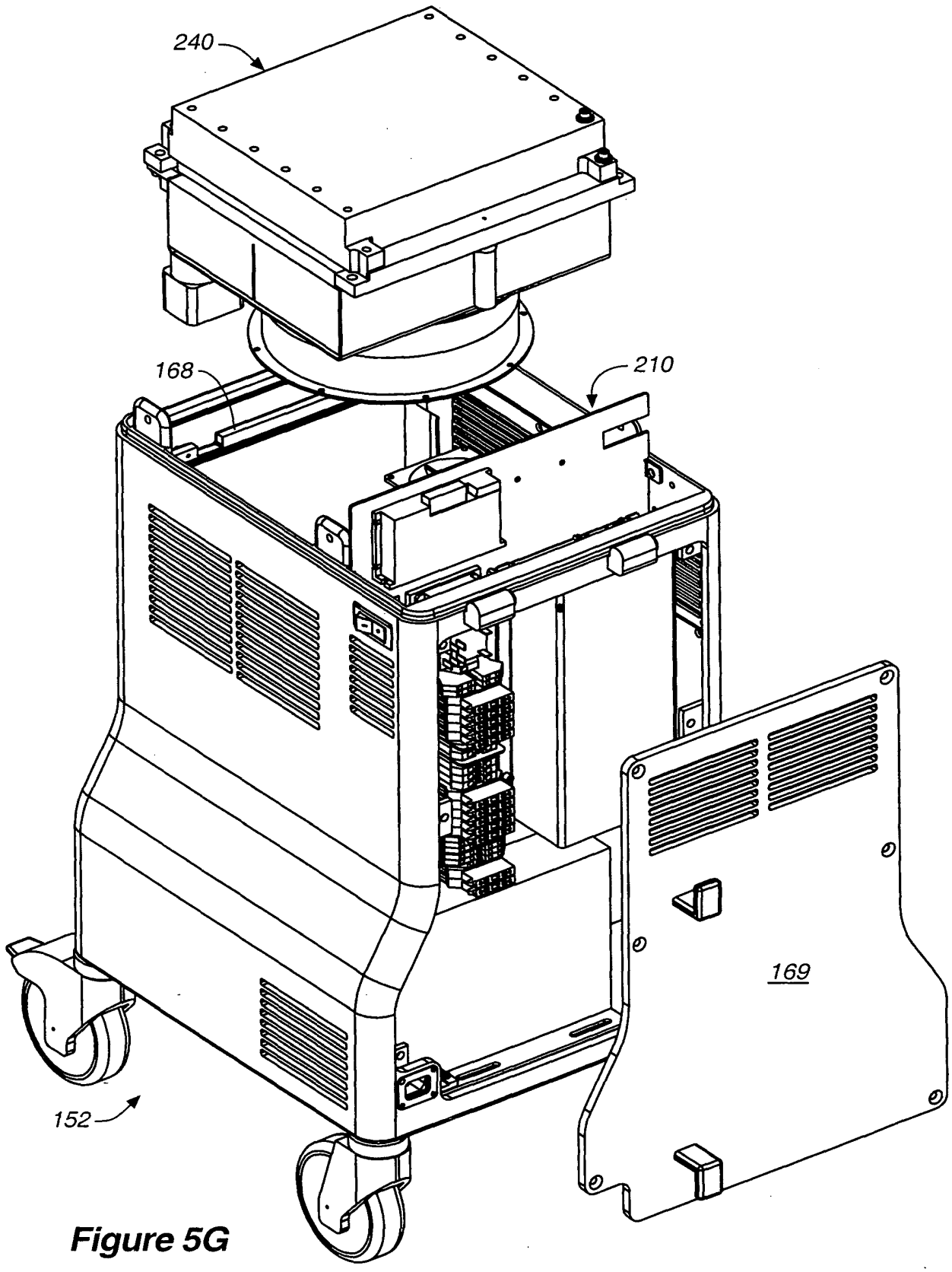

Figure 5G

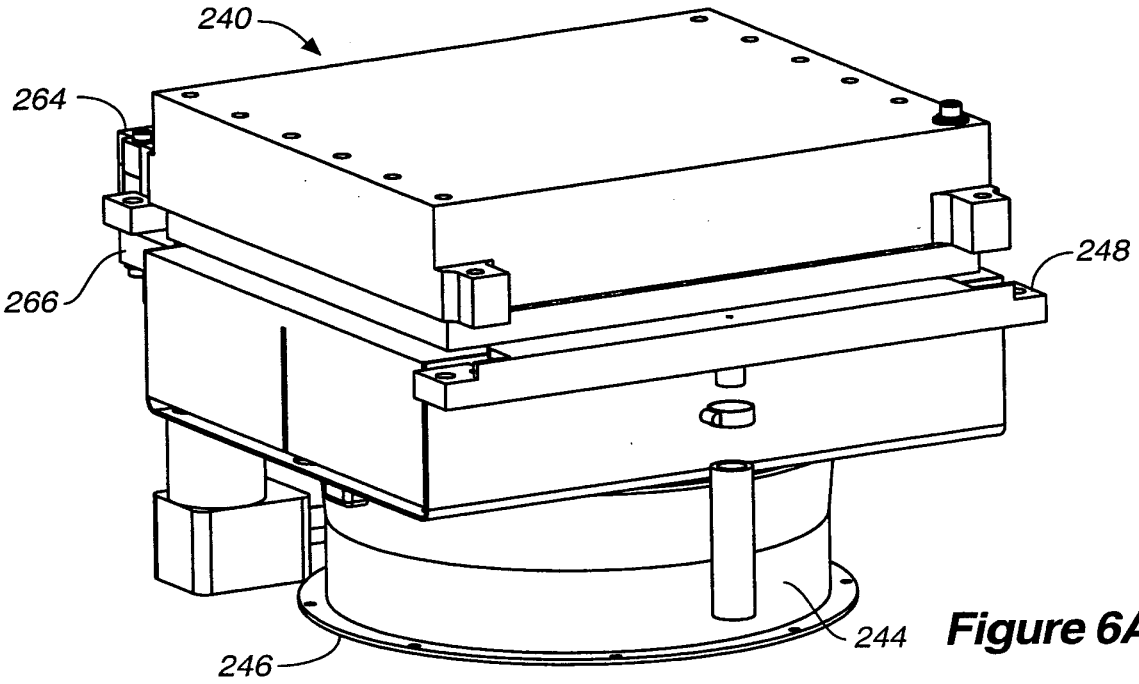

Figure 6A

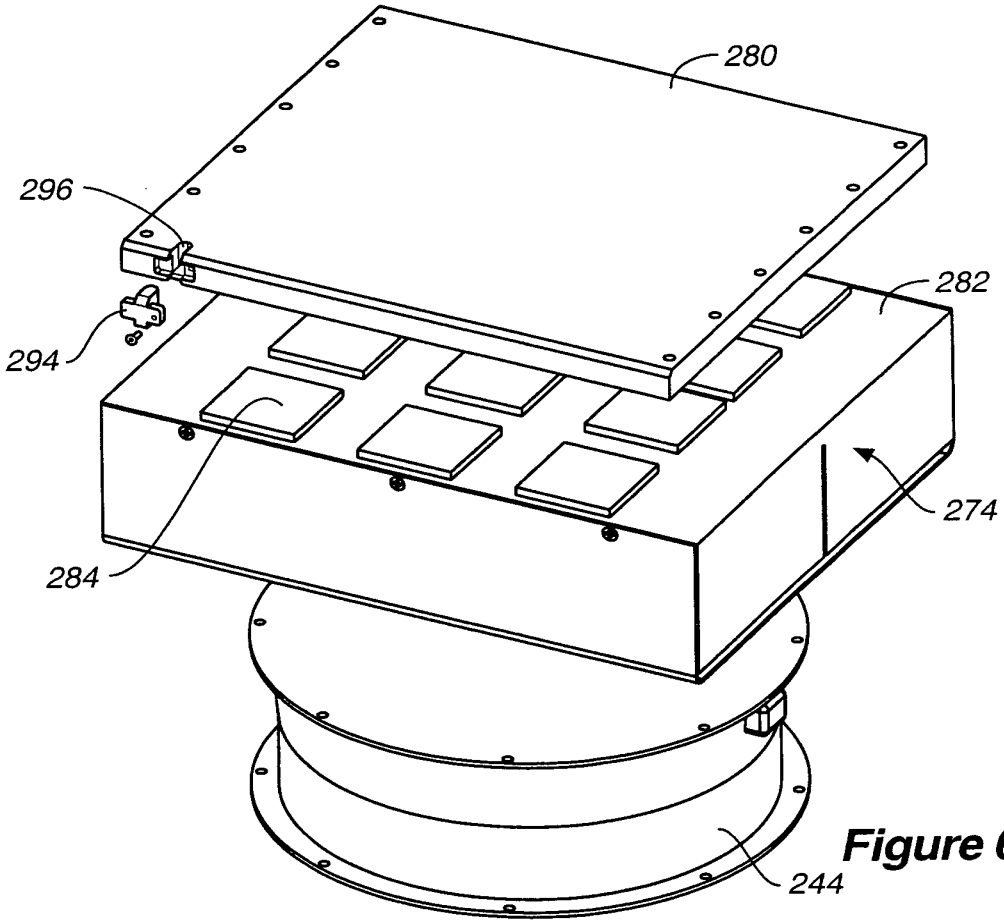

Figure 6C

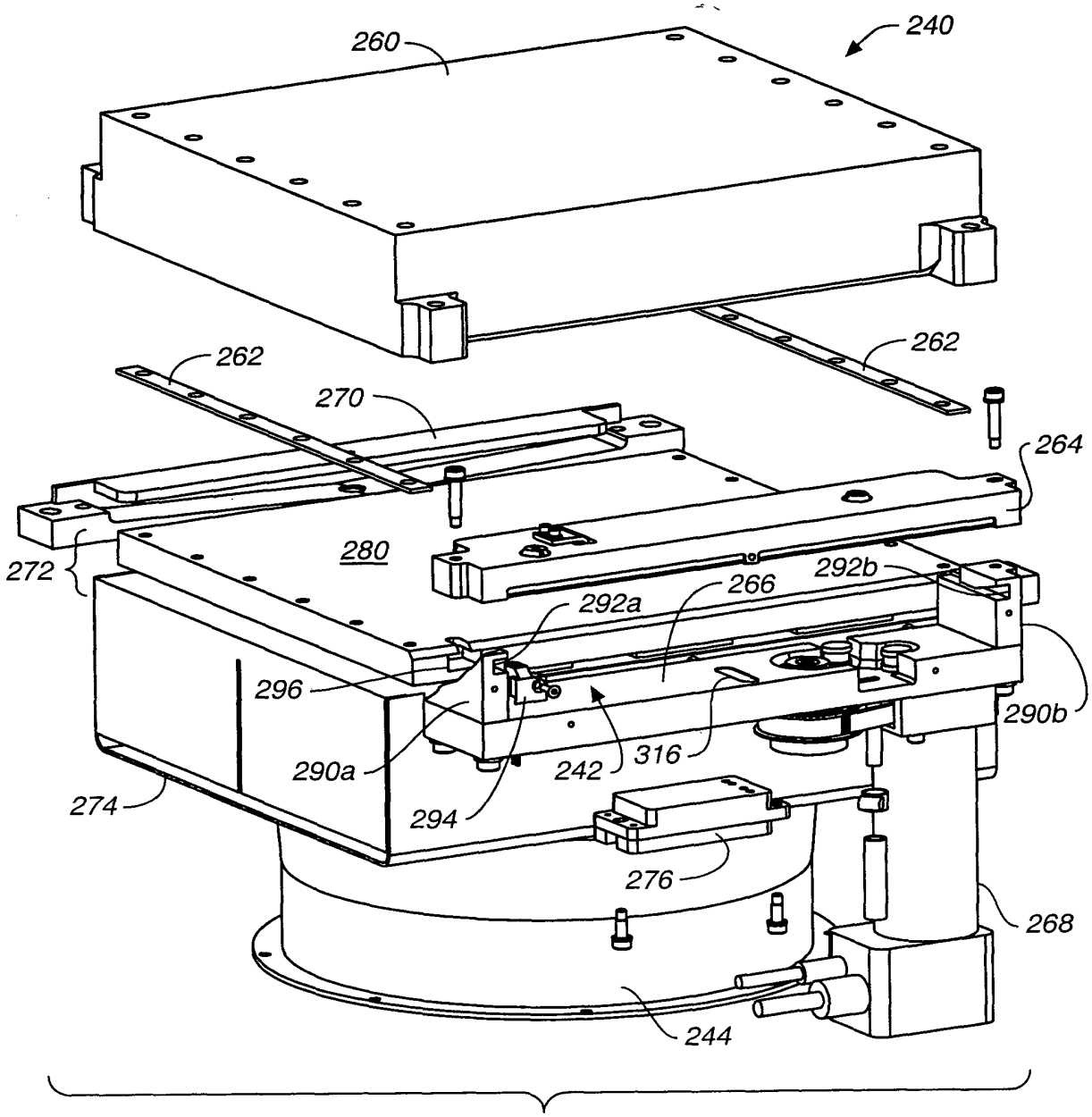
260
240
262
262
270
264
280
272
292b
292a
266
296
290b
290a
242
316
274
294
276
268
244

Figure 6B

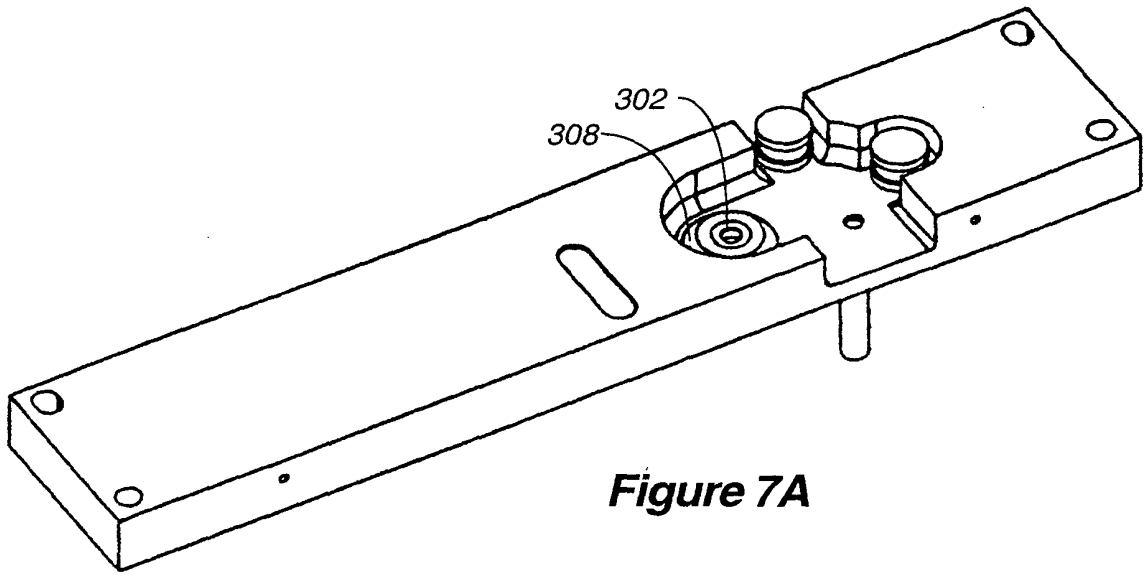

Figure 7A

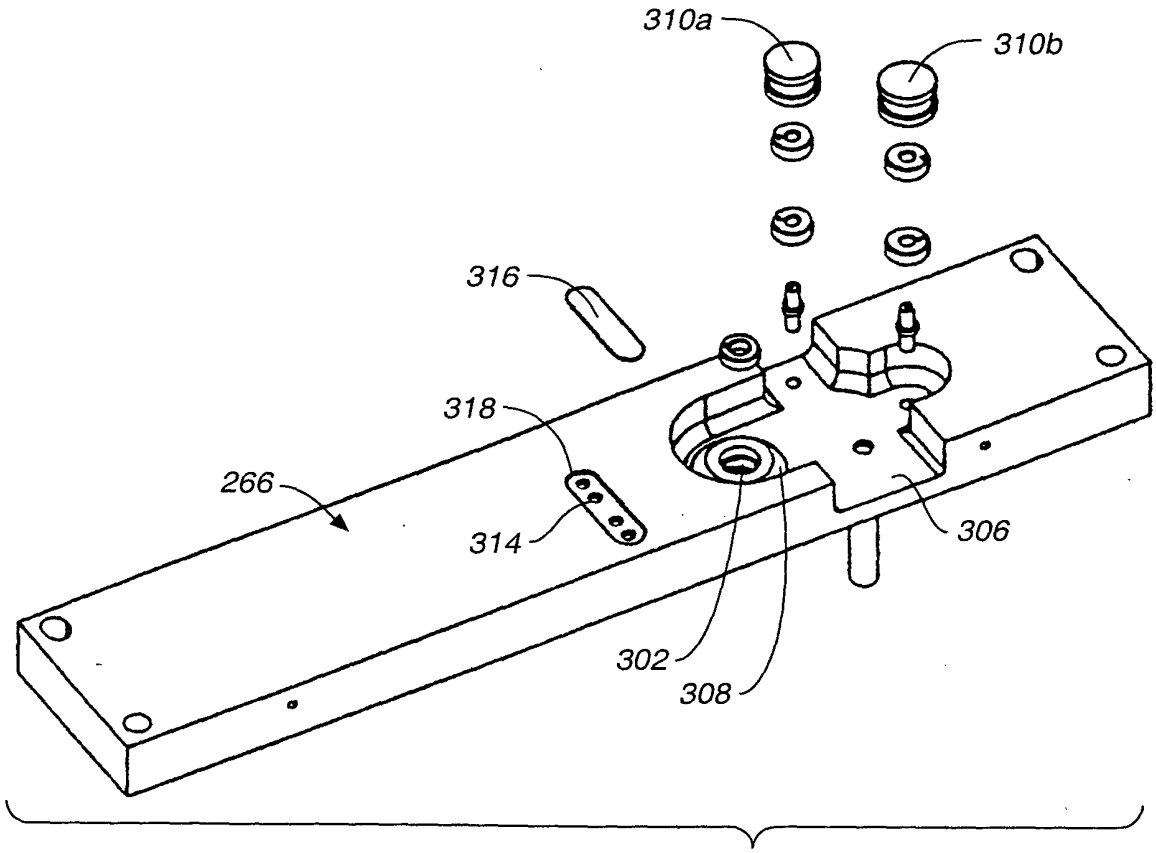

Figure 7B

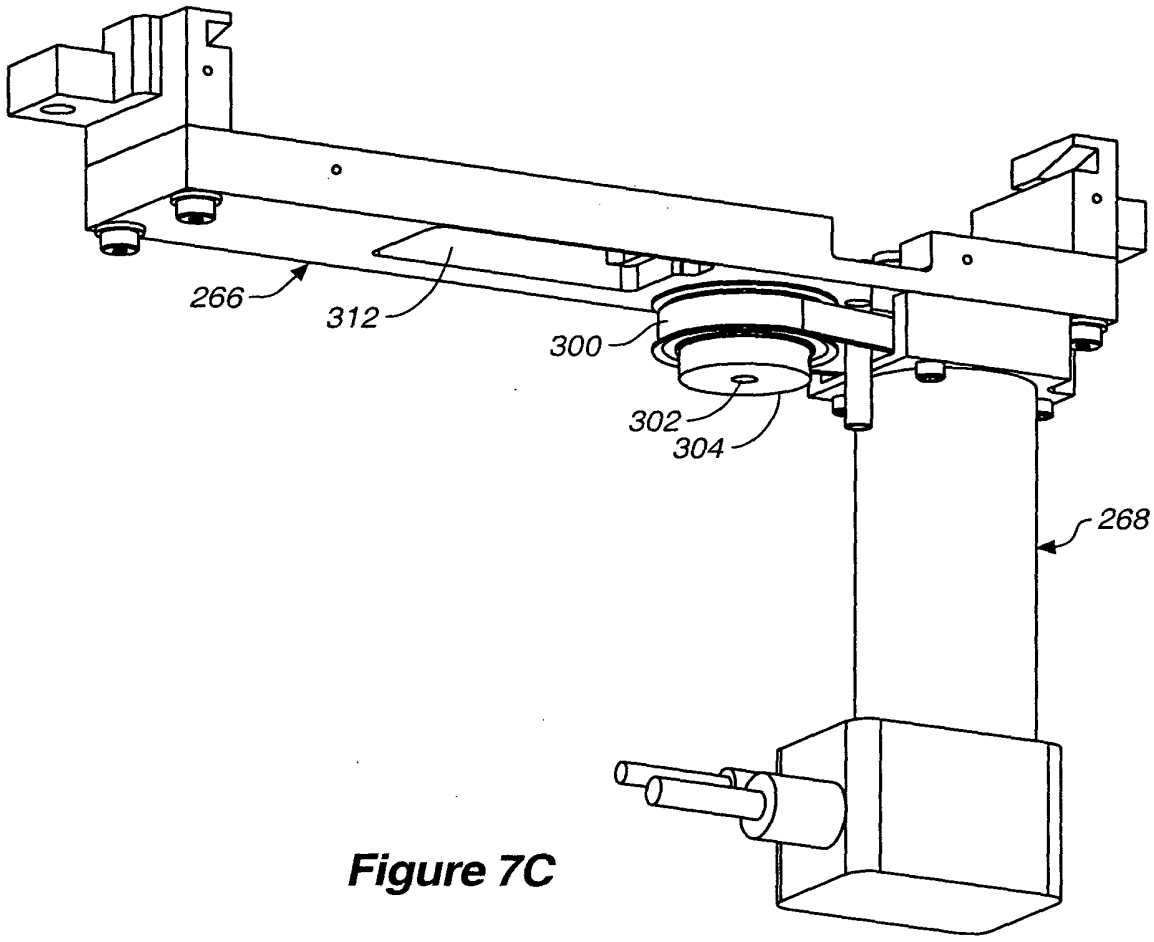

Figure 7C

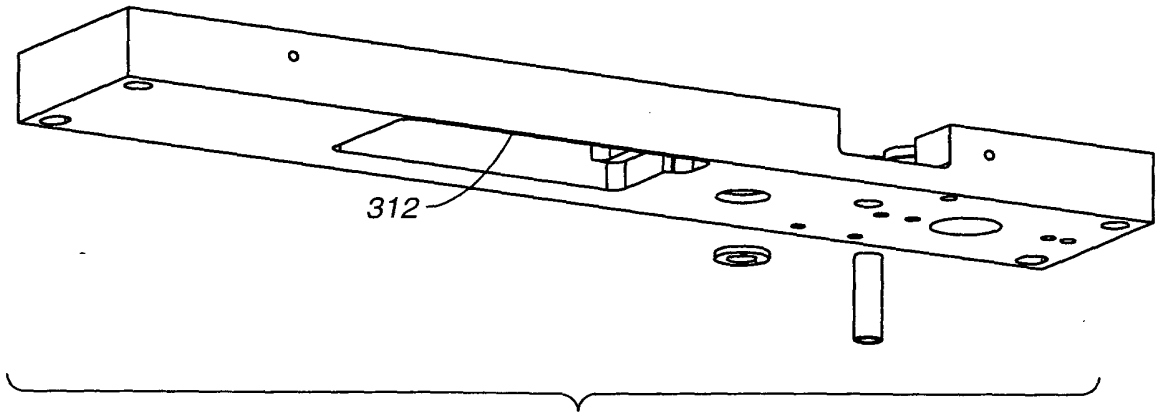

Figure 7D

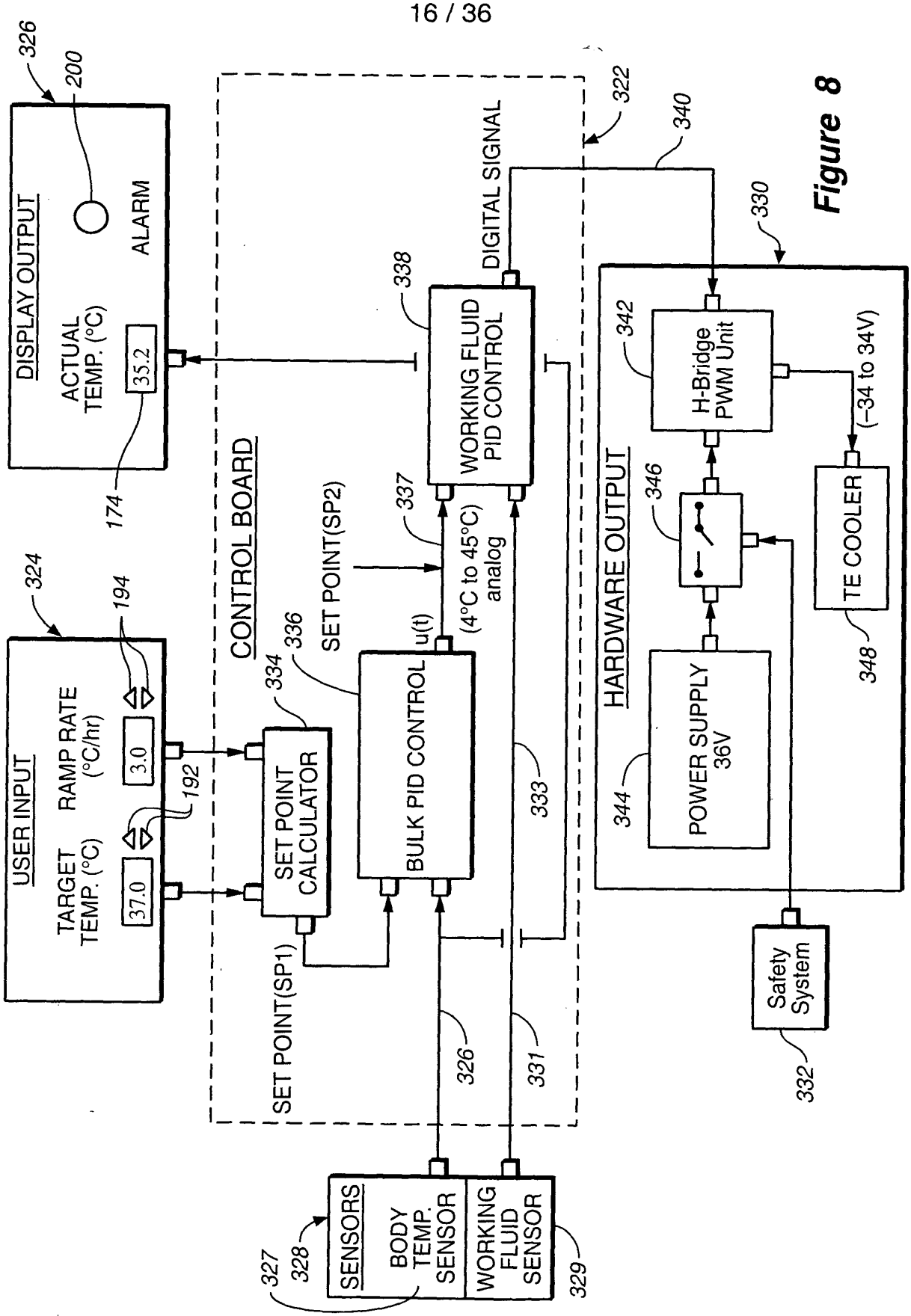
326
200
DISPLAY OUTPUT
ACTUAL TEMP. (°C)
35.2
ALARM
174
324
194
USER INPUT
TARGET TEMP. (°C)
37.0
RAMP RATE (°C/hr)
3.0
192
CONTROL BOARD
SET POINT CALCULATOR
334
336
SET POINT(SP2)
SET POINT(SP1)
BULK PID CONTROL
u(t)
337
(4°C to 45°C) analog
WORKING FLUID PID CONTROL
338
DIGITAL SIGNAL
322
340
333
326
331
SENSORS
BODY TEMP. SENSOR
WORKING FLUID SENSOR
327
328
329
330
HARDWARE OUTPUT
H-Bridge PWM Unit
342
(-34 to 34V)
346
TE COOLER
348
POWER SUPPLY 36V
344
Safety System
332

Figure 8

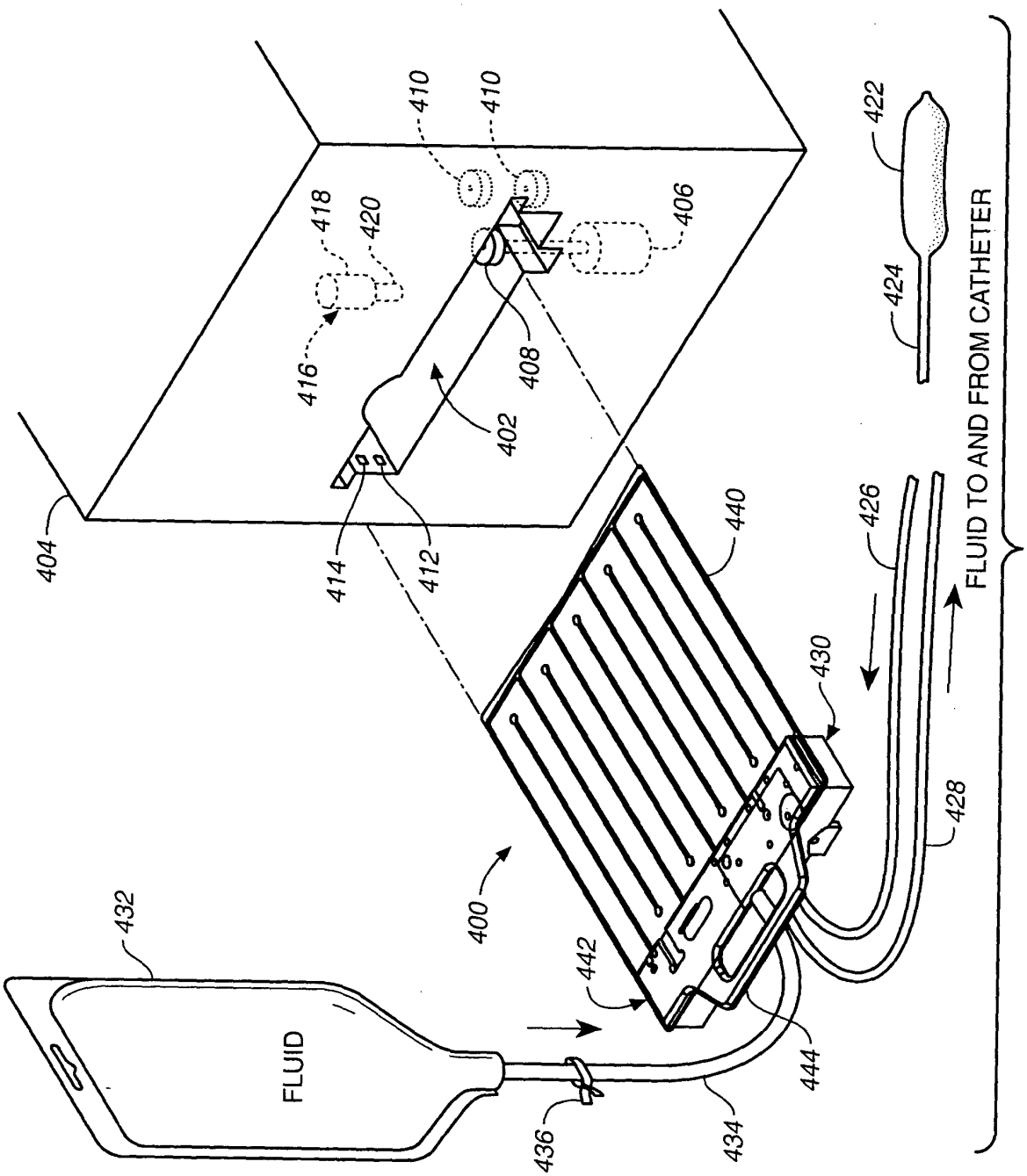
410
410
422
418
420
406
424
416
408
402
404
414
412
440
426
430
FLUID TO AND FROM CATHETER
428
400
432
442
FLUID
444
436
434

Figure 9

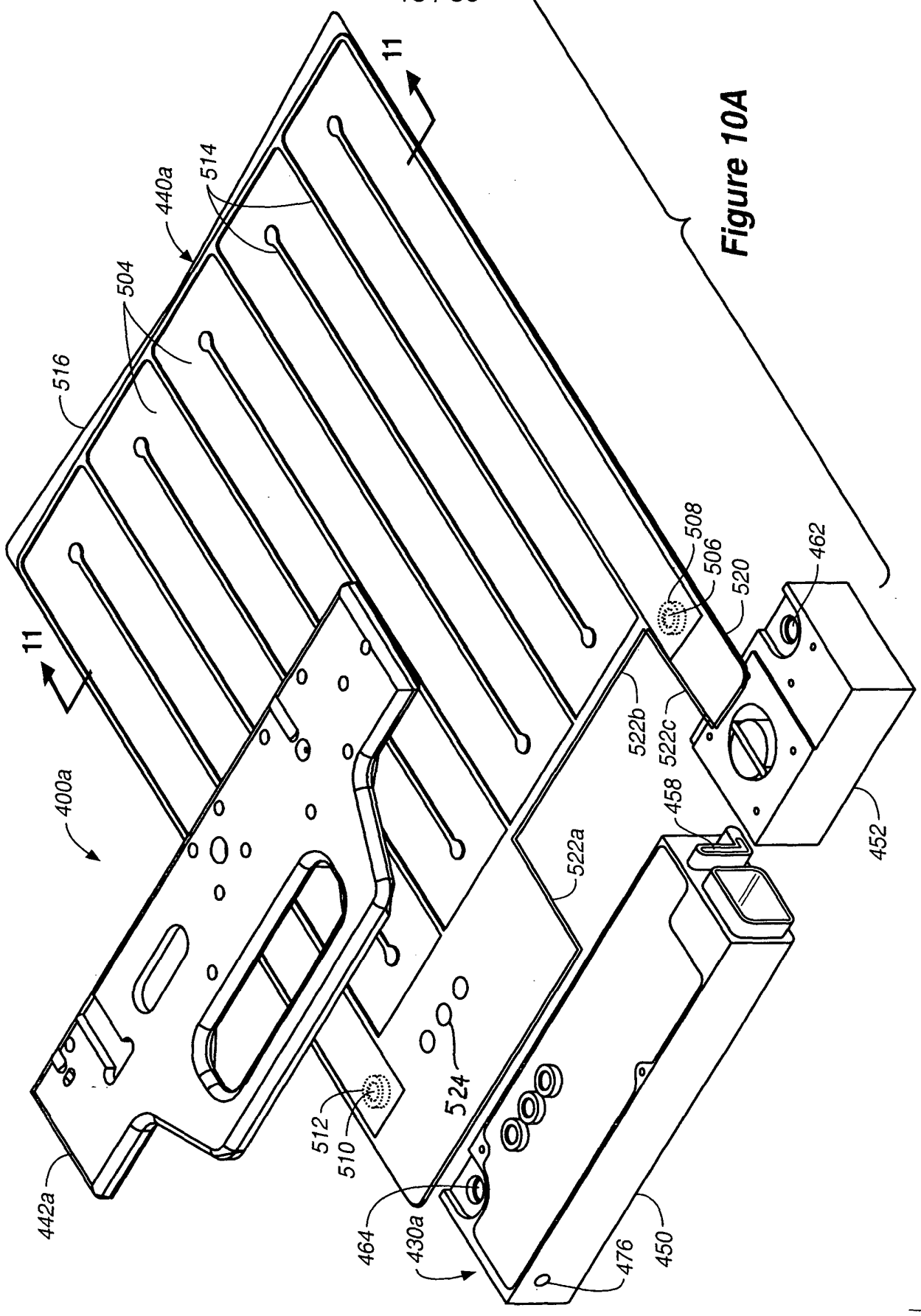
11
11
440a
514
504
516
400a
442a
512
510
524
464
430a
476
450
522a
458
452
522b
522c
508
506
520
462

Figure 10A

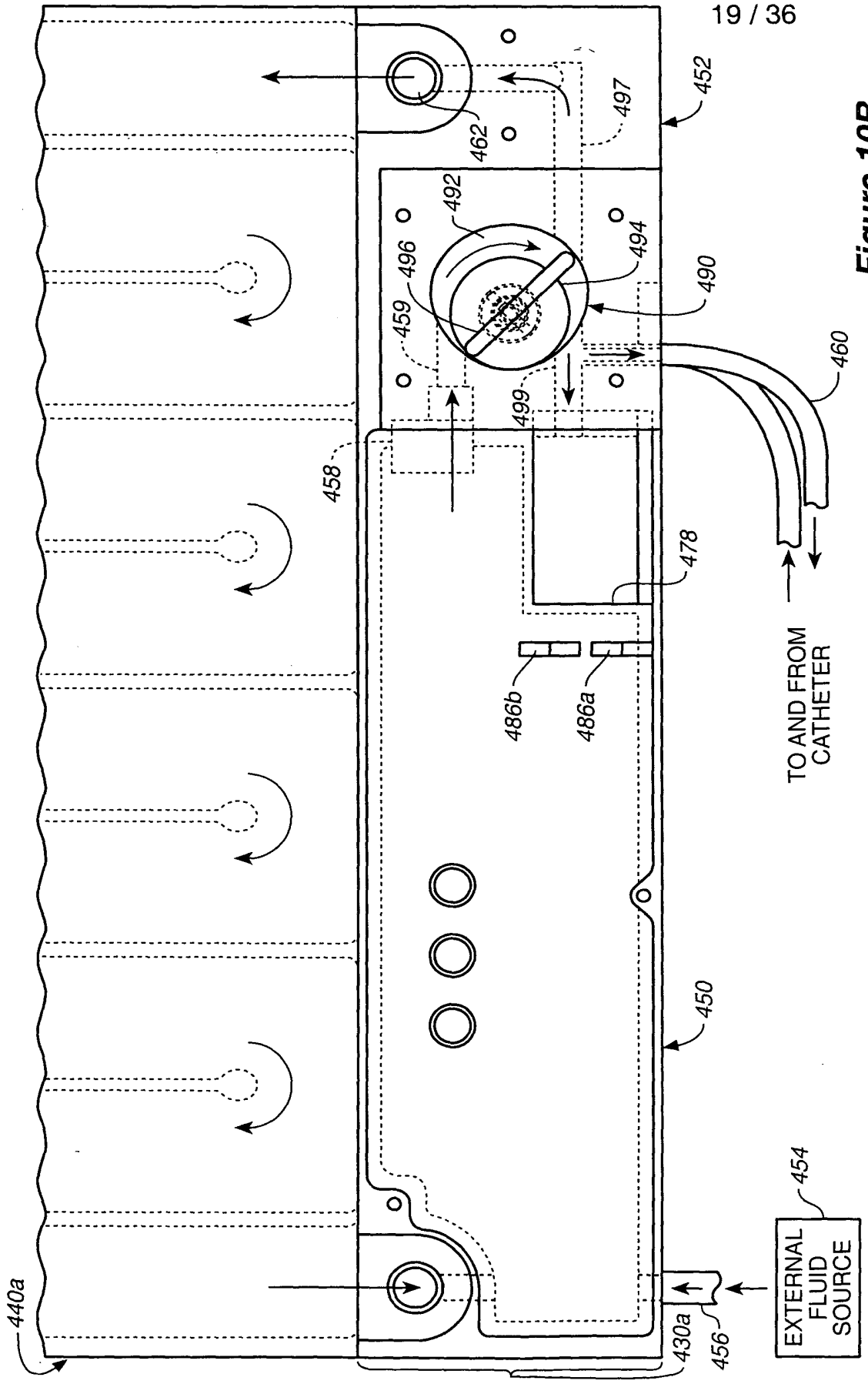
452
497
462
492
494
496
490
459
460
499
458
478
486b
486a
TO AND FROM CATHETER
450
454
EXTERNAL FLUID SOURCE
440a
430a
456

Figure 10B

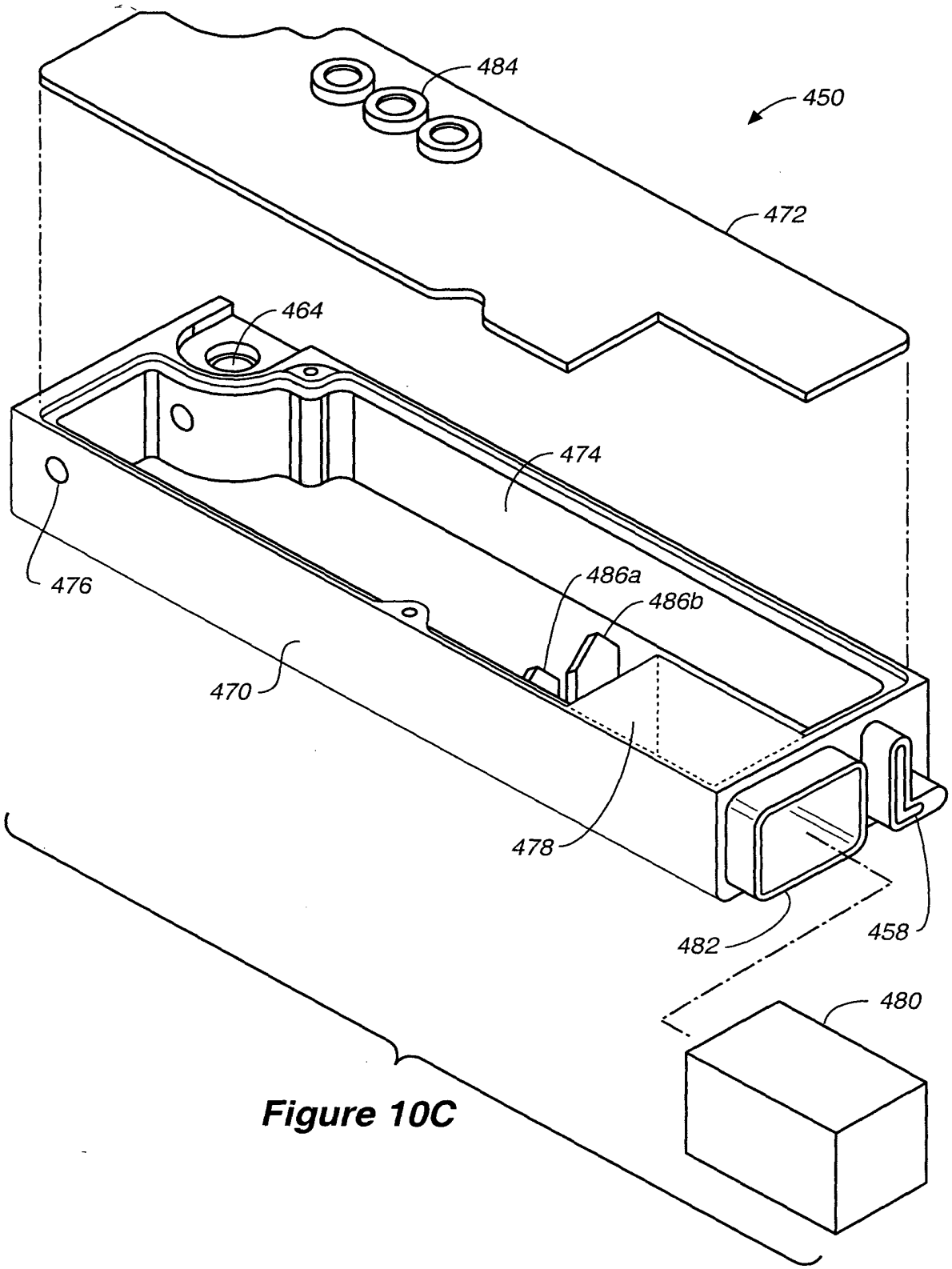

Figure 10C

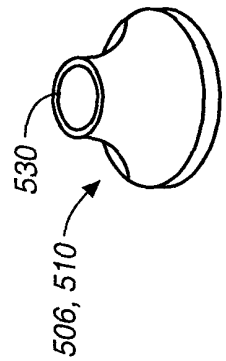

Figure 12A

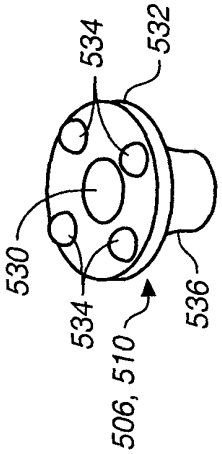

Figure 12B

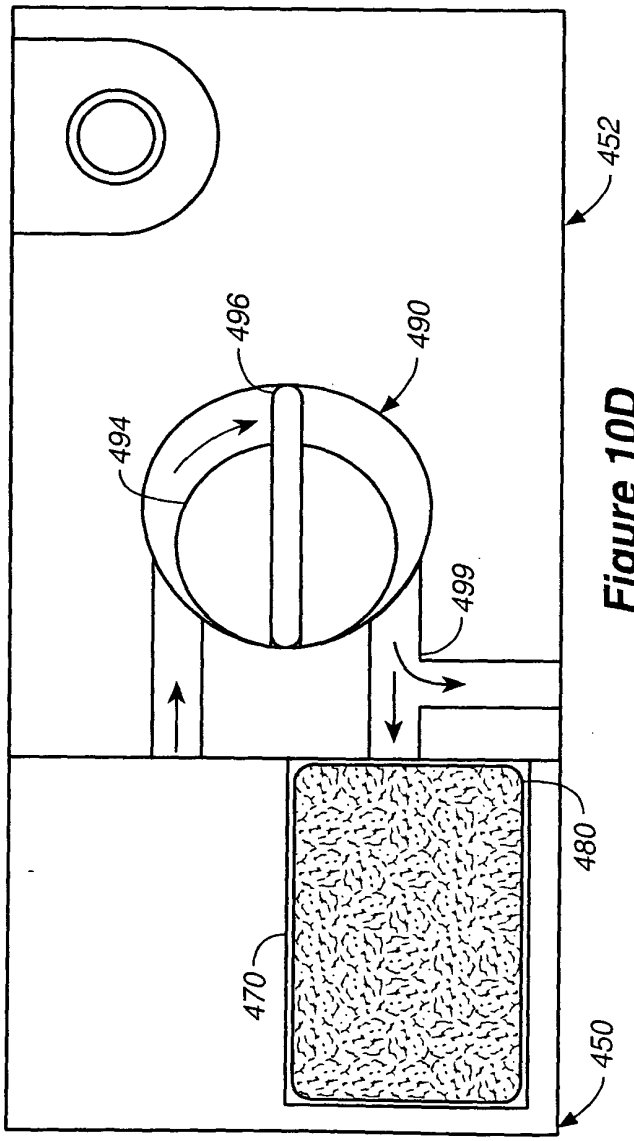

Figure 10D

Figure 11A

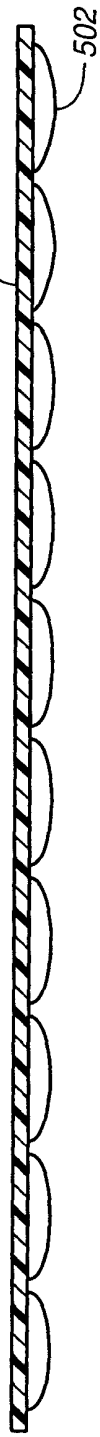

Figure 11B

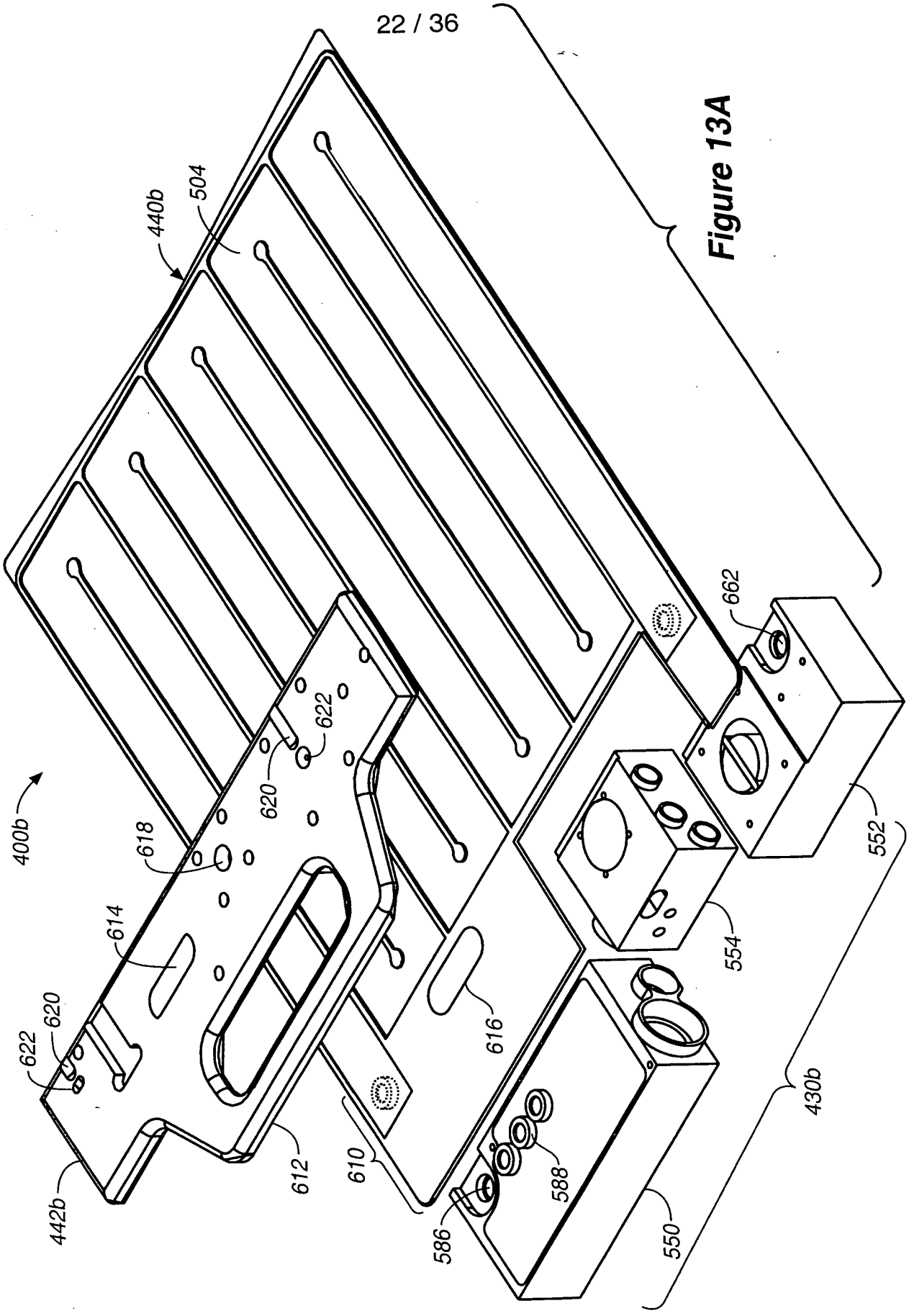
440b
504
400b
618
614
620
622
612
610
442b
616
662
552
554
588
586
550
430b

Figure 13A

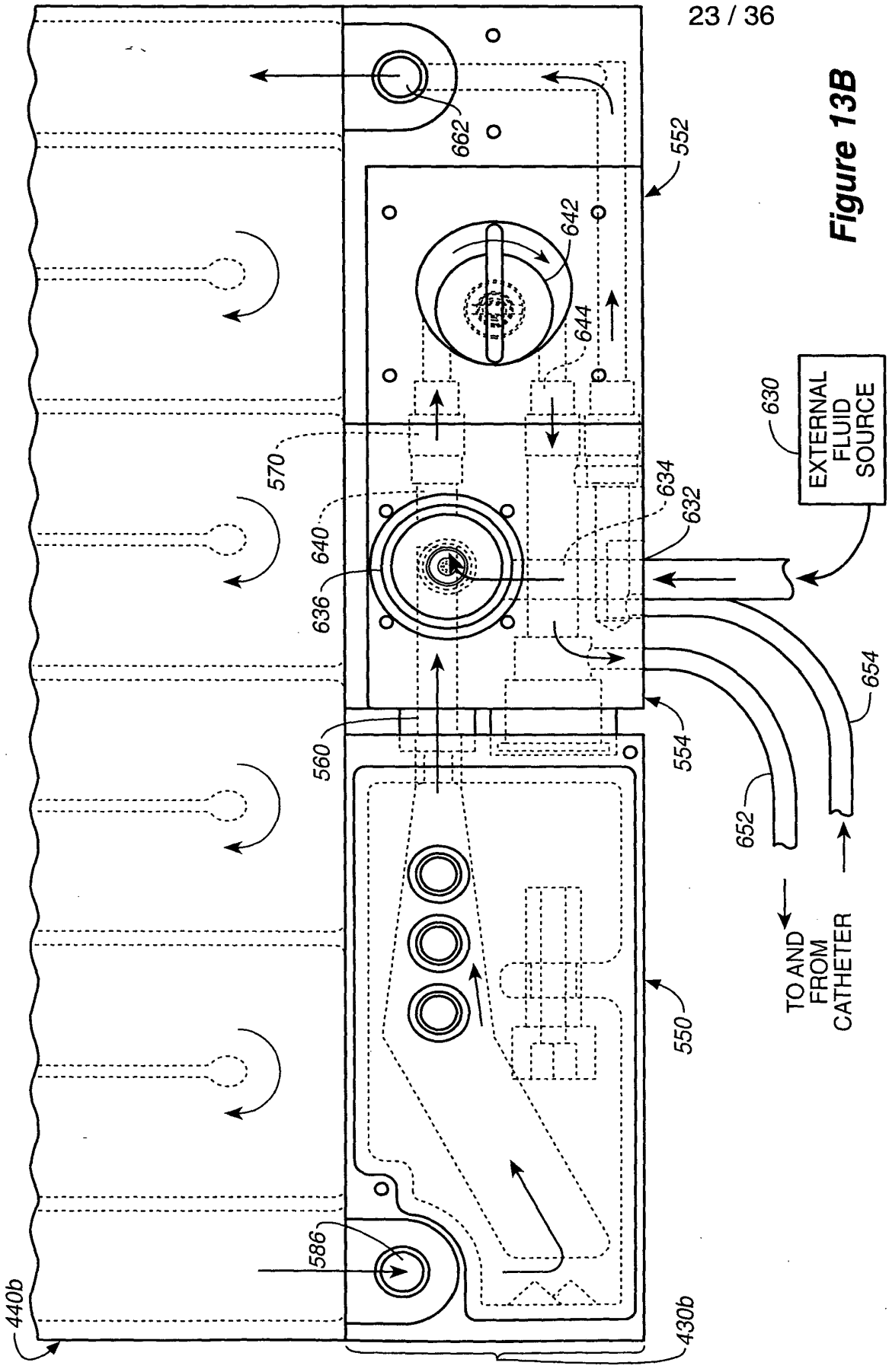
662
552
642
644
630
EXTERNAL FLUID SOURCE
570
634
632
640
636
654
560
554
652
TO AND FROM CATHETER
550
586
440b
430b

Figure 13B

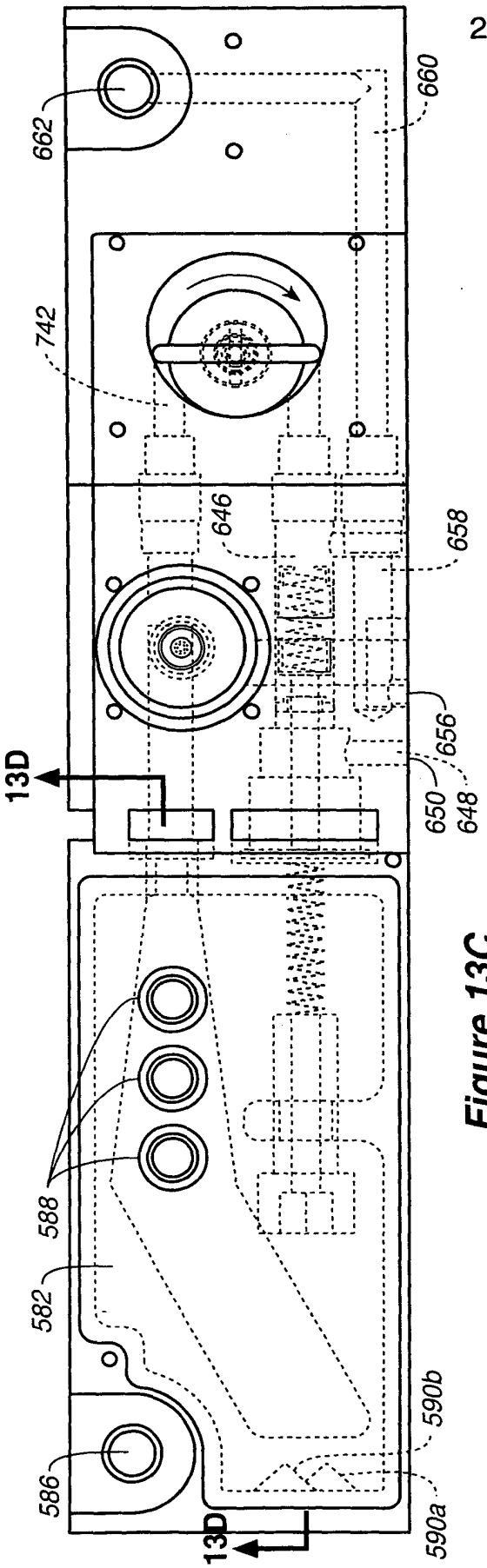

Figure 13C

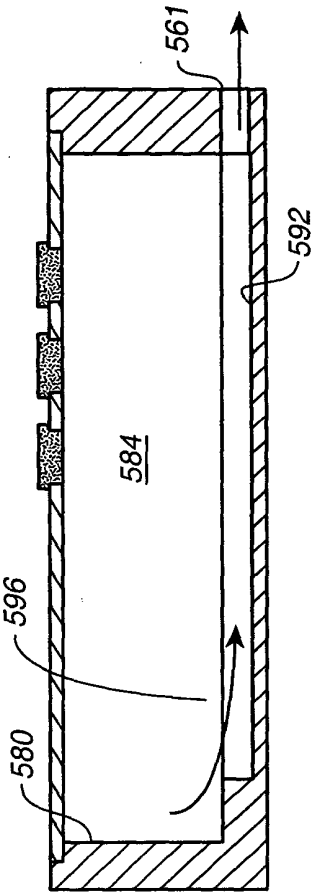

Figure 13D

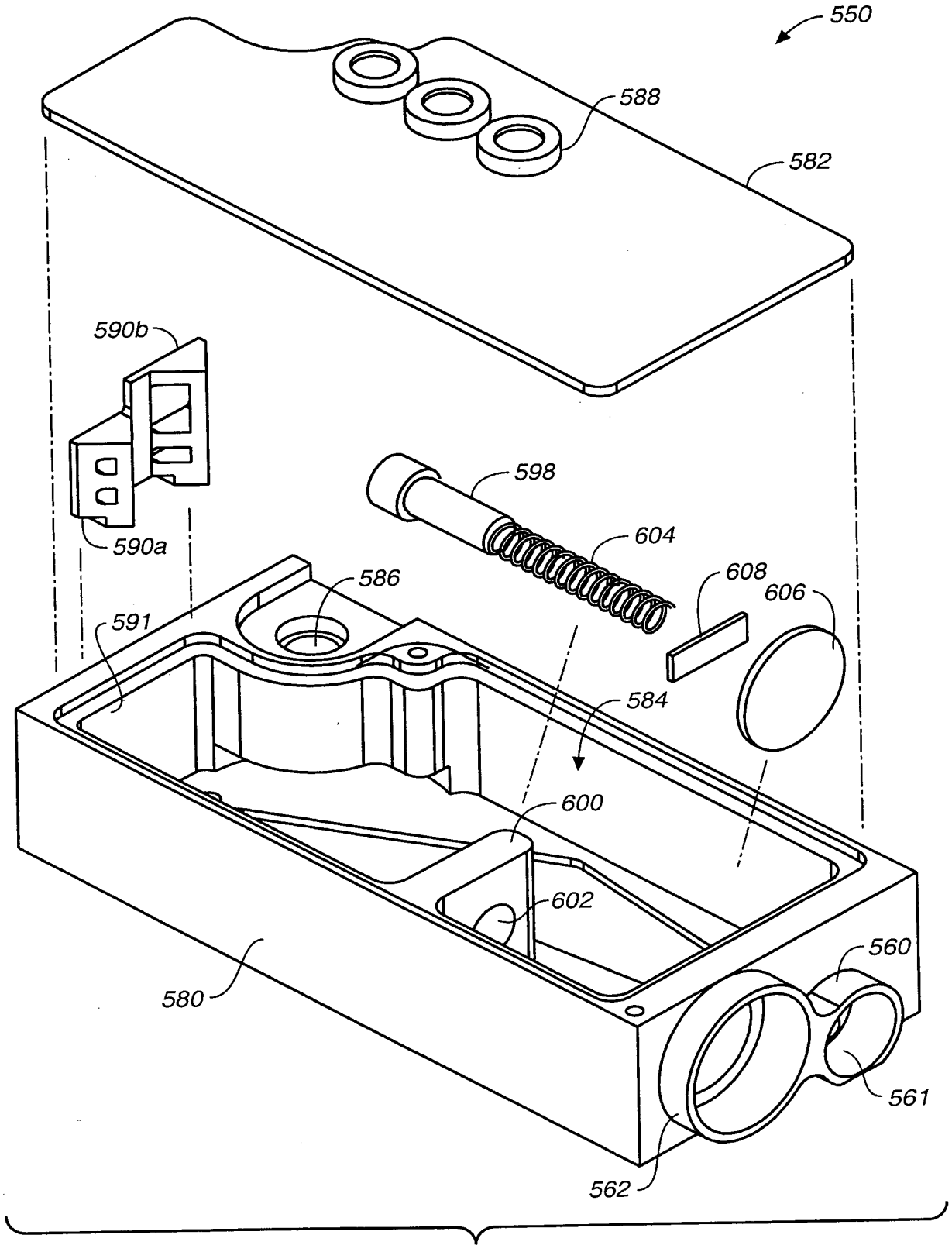
550
588
582
590b
590a
598
604
586
608
606
591
584
600
602
560
580
561
562

Figure 13E

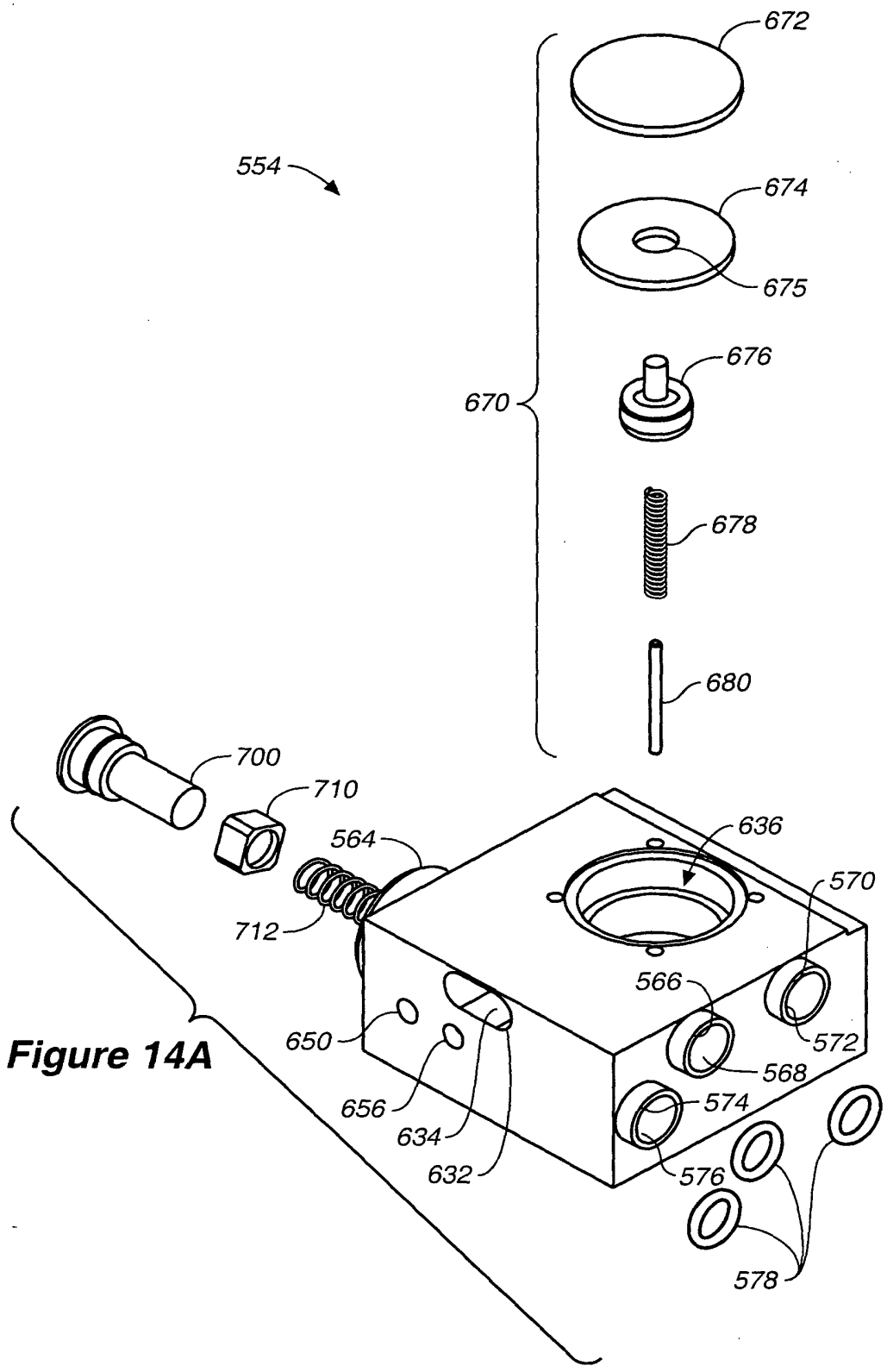
672
554
674
675
676
670
678
680
700
710
564
636
570
712
566
572
650
568
574
656
634
632
576
578

Figure 14A

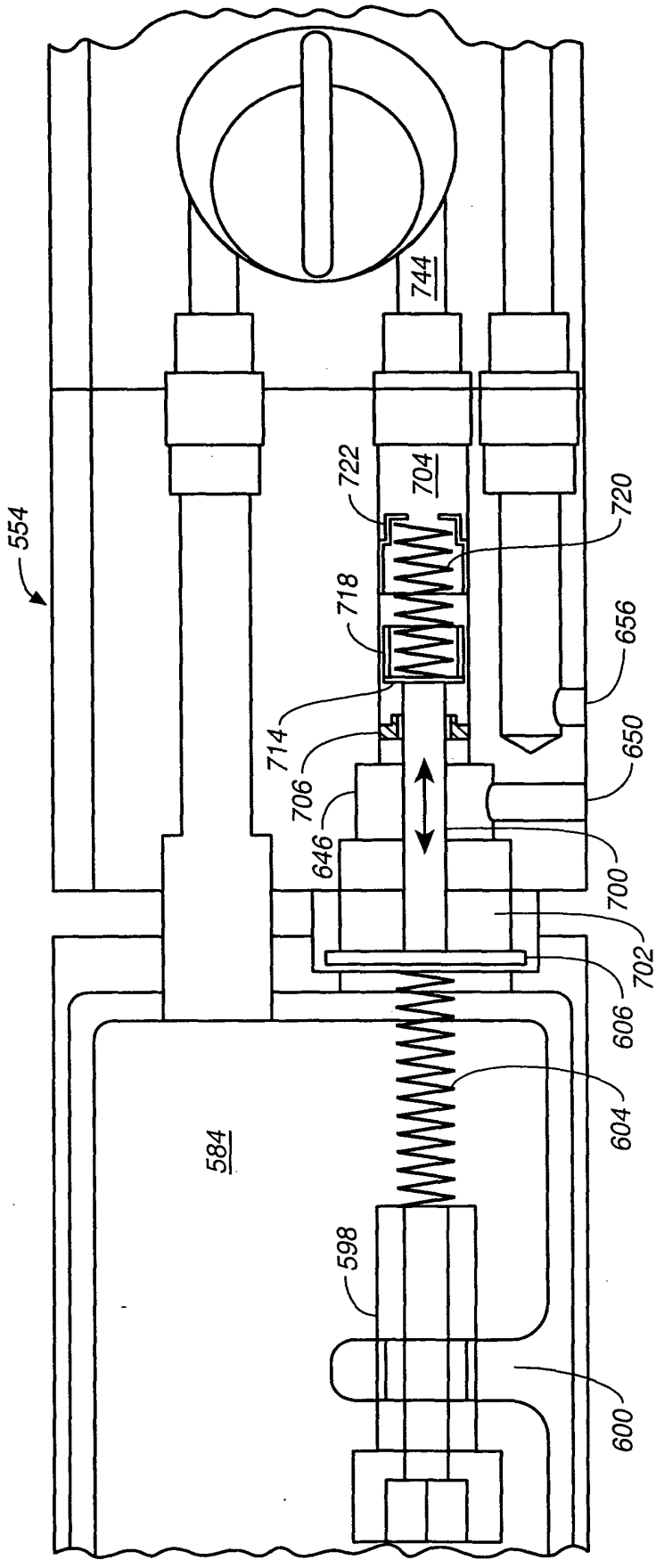

Figure 14B

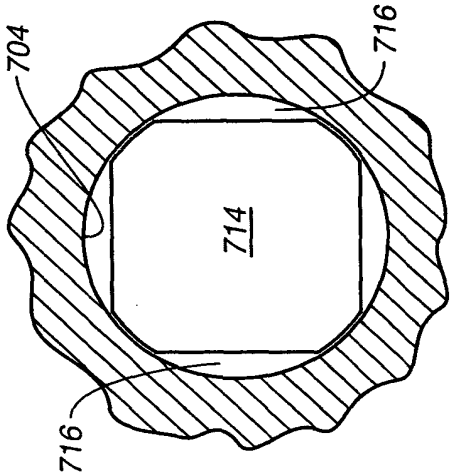

Figure 14G

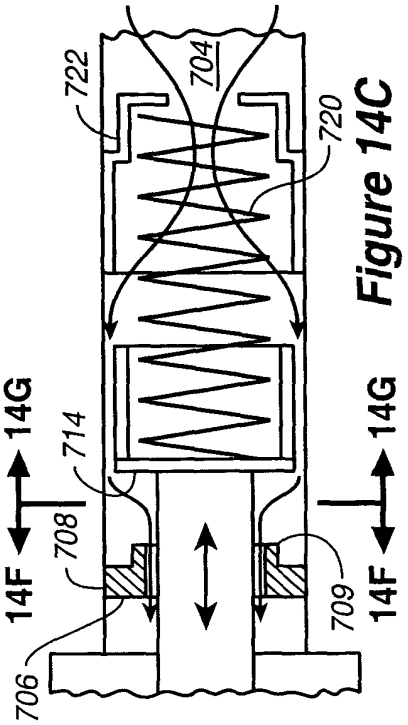

Figure 14C

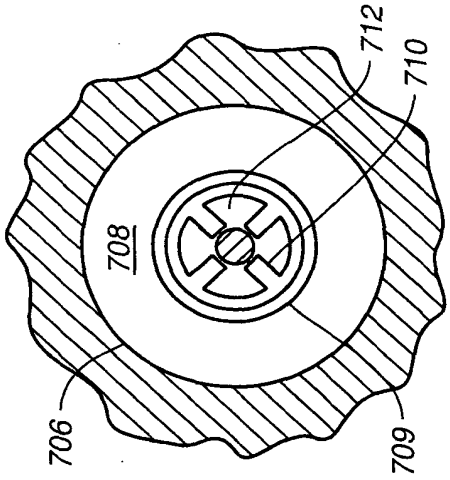

Figure 14F

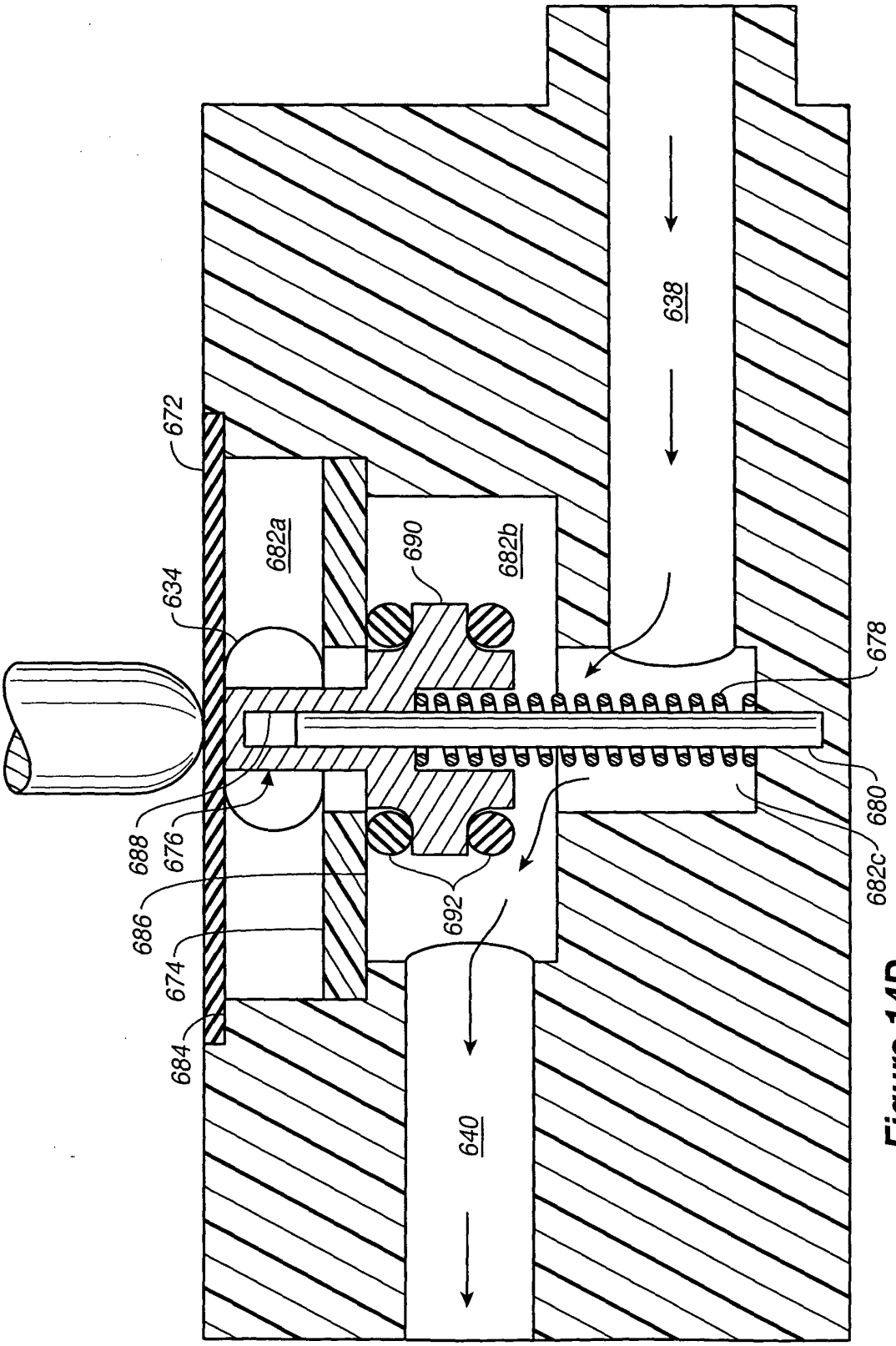
638
672
682a
690
682b
634
678
688
676
680
682c
686
692
674
684
640

Figure 14D

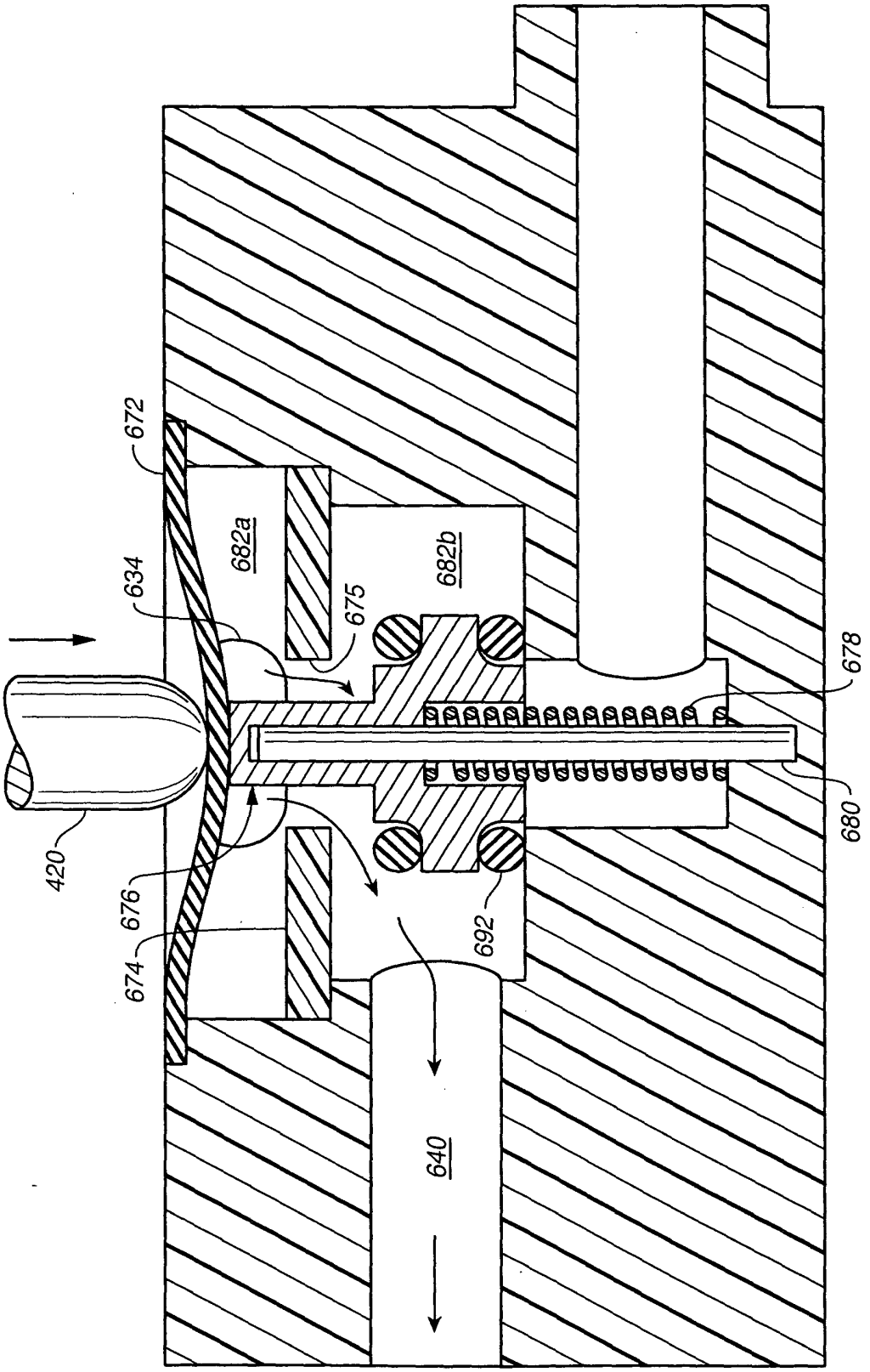

Figure 14E

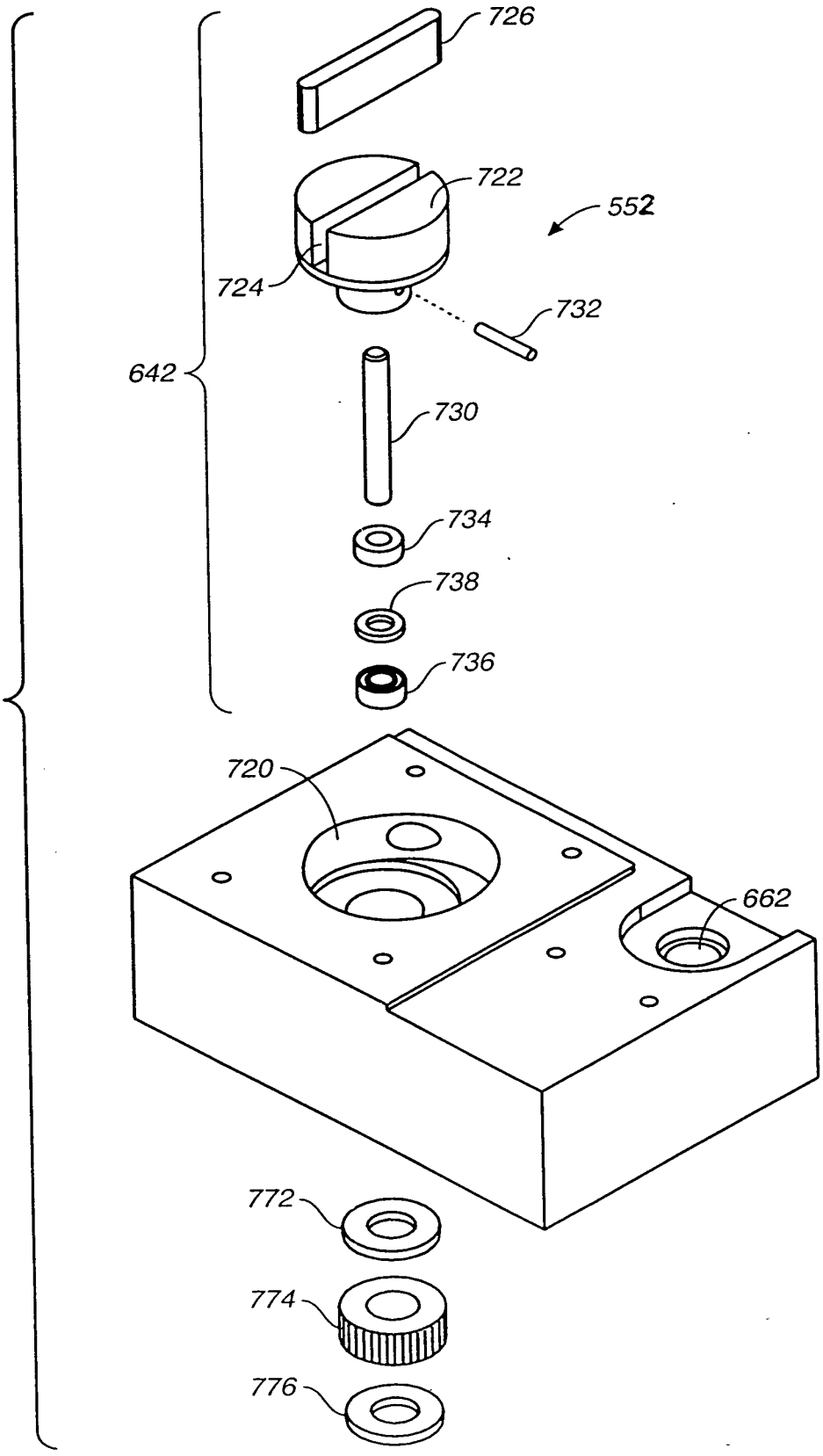

Figure 15A

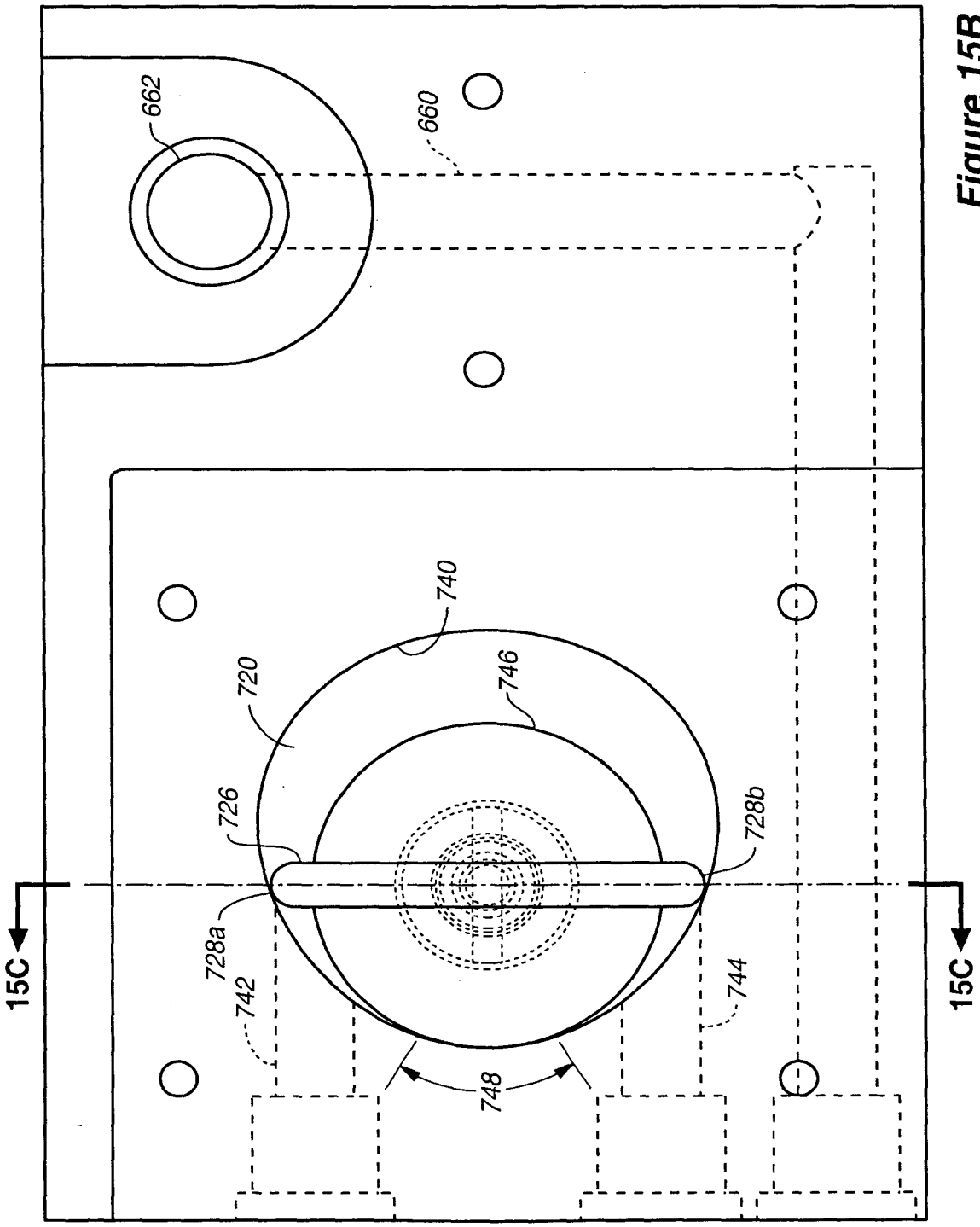

Figure 15B

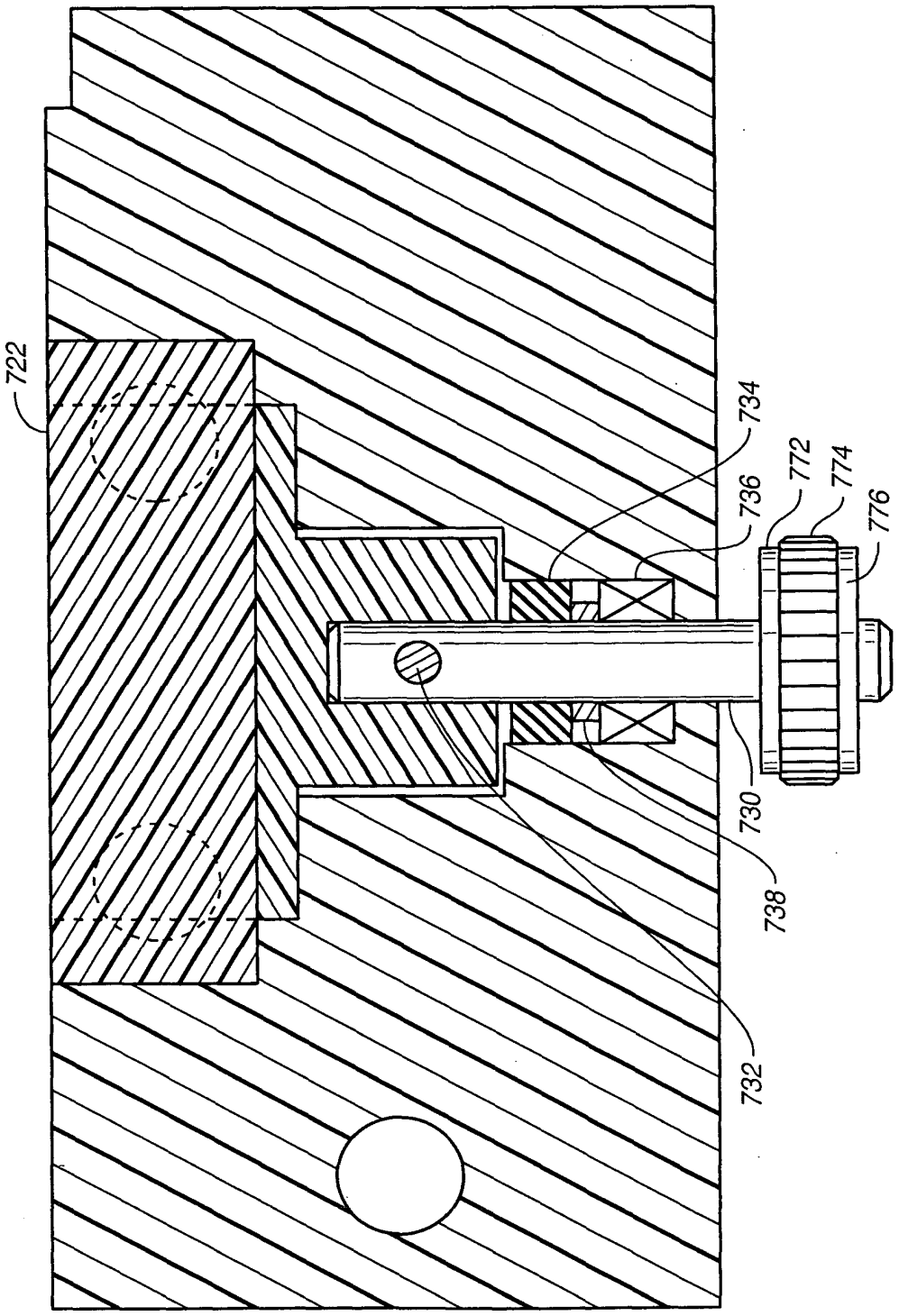

Figure 15C

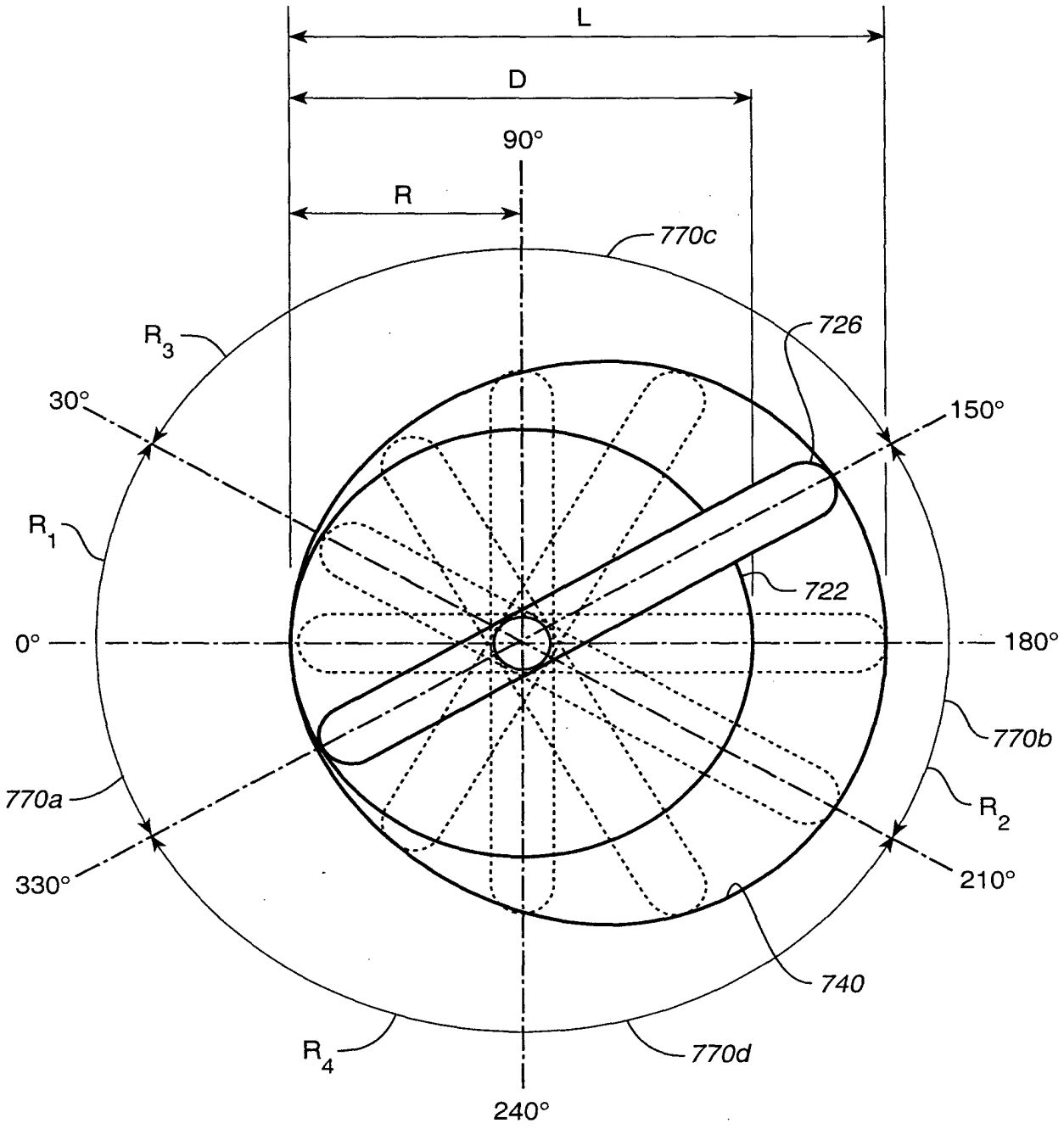
L
D
90°
R
770c
726
R3
30°
150°
R1
722
0°
180°
770b
770a
R2
330°
210°
740
R4
770d
240°

Figure 15D

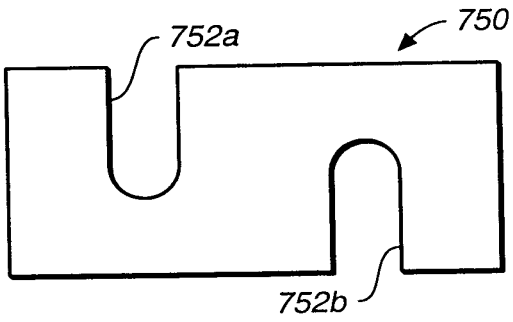

Figure 16A

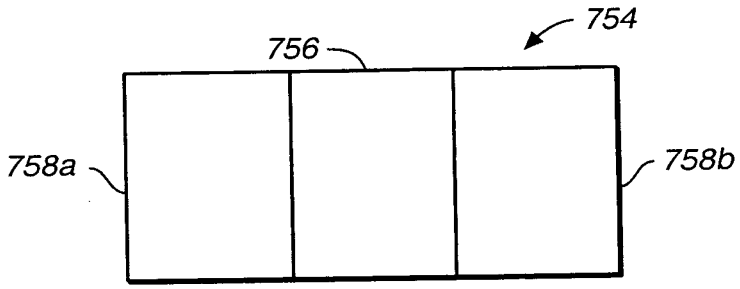

Figure 16B

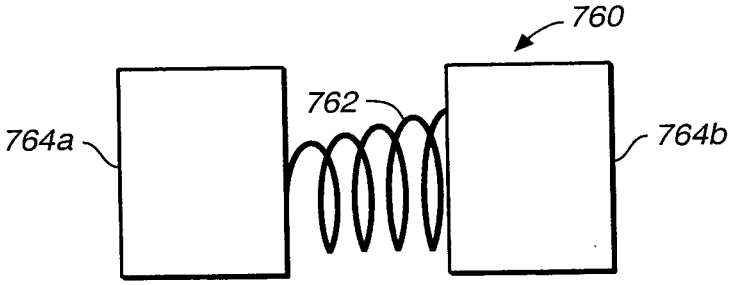

Figure 16C

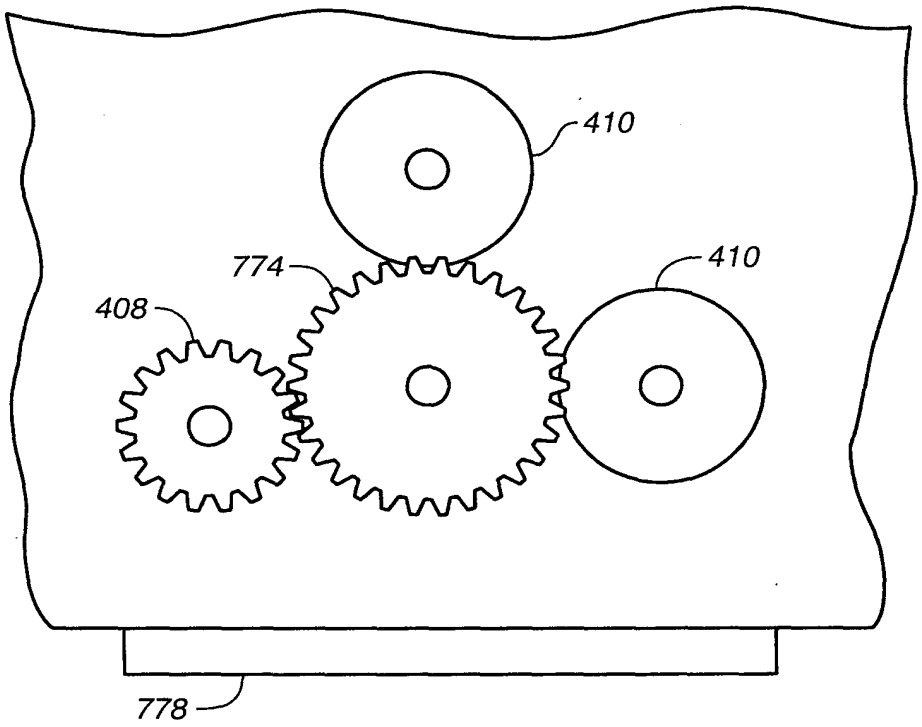

Figure 17A

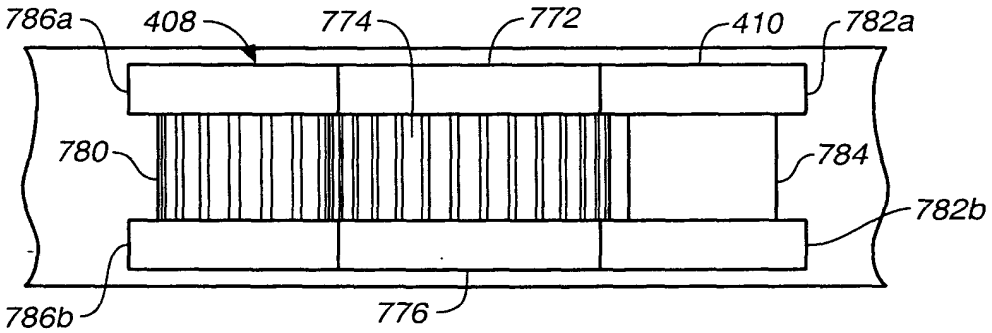

Figure 17B

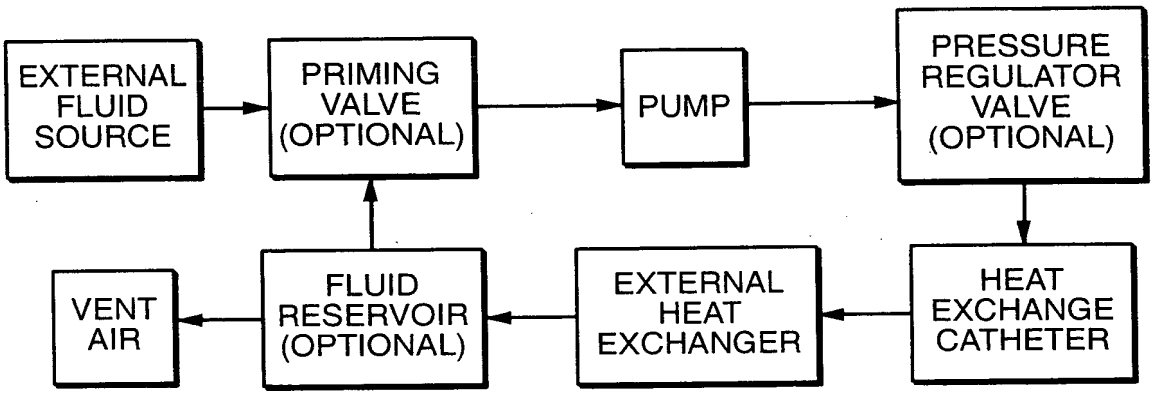

Figure 18A

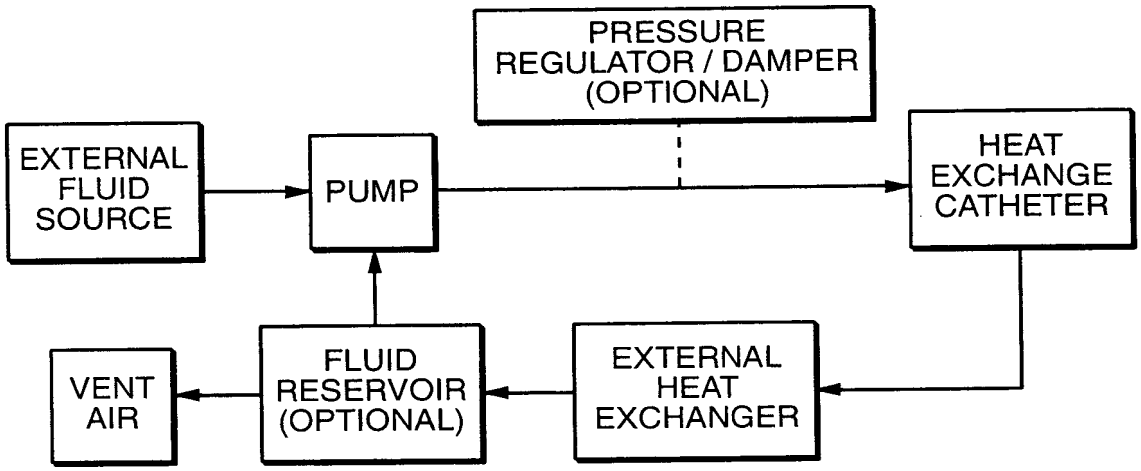

Figure 18B

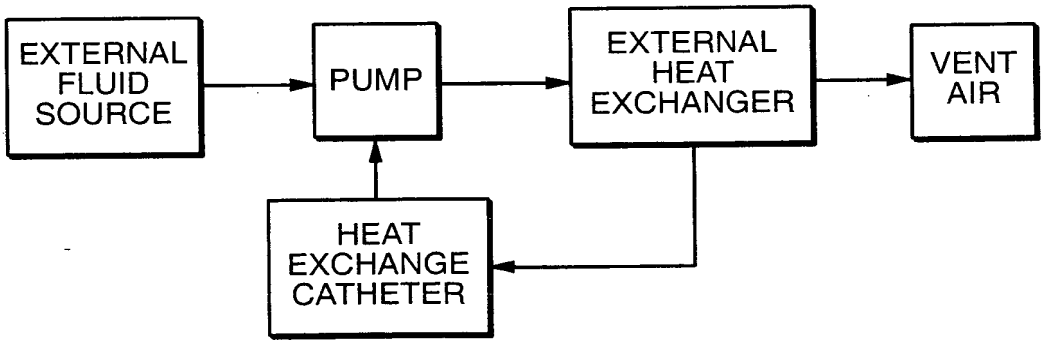

Figure 18C